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BRITISH AND FOREIGN MEDICO-CHIRURGICAL REVIEW.

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PART FIRST.

Analytical and Critical Reviews.

REVIEW I.

1. *Report of the Sanitary Commission of New Orleans on the Epidemic Yellow Fever of* 1853. Published by Authority of the Council of New Orleans.—*New Orleans*, 1854. pp. 542.
2. *Yellow Fever, Considered in its Historical, Pathological, Etiological, and Therapeutical Relations.* By R. LA ROCHE, M.D., Member of the American Philosophical Society, of the American Medical Association, Fellow of the College of Physicians of Philadelphia, &c.—*Philadelphia*, 1855. 2 vols. pp. 615. pp. 813.

IN the wide range of science, there are, it might be supposed, few subjects which more deserve the serious consideration of humane and civilized governments than the causes which influence the spread of epidemic diseases; yet, strange to say, compared with other subjects of far less importance, they have received but little attention. There can be no better proof of this than the stolid indifference with which we regard the late cholera epidemic, which swept away some fifteen thousand of our fellow-creatures from this busy metropolis in the course of a few weeks. While it lasted, we taxed our energies to devise means to stay its progress, and to prevent its recurrence. Brooms and dust-carts were called into requisition, and masses of filth which had been deeply buried in the earth were exhumed and carried to a distance; the nauseous breath of drains and cesspools was stifled by lime, while the parochial authorities waged war against the impurities which for ages had poisoned the dwellings of the poor; but hardly had the last victim of the pestilence been consigned to the grave, when we relapsed into our former state of indifference. Filth of every description has again been allowed to accumulate, while the poor from their washing have returned to wallow in the mire which is almost inseparable from their humble

condition. When a ship founders at sea, or when a train runs off the line and imperils the lives of the passengers, the country cries aloud for an inquiry, and the Government are compelled to grant it. The causes which led to the disaster are examined, and new laws made to prevent the recurrence of any similar accident; but epidemics which destroy thousands and tens of thousands in the course of a few weeks or months, are allowed to pass unnoticed, as if the question of their origin was of less importance than the smoking of a London chimney. This is greatly to be deplored, for although we must confess our ignorance with respect to the real nature of the agencies or germs by which exanthematous and other contagious diseases are produced and propagated, we are well acquainted with their modes of action—we know that their efficiency is reduced or destroyed by dilution or diffusion, by distance and by time. We are thus, by adopting proper precautionary measures, enabled to control the spread of these epidemics at home, and to prevent their extension into lands beyond the sea. This we believe will not be disputed. There are many, however, who are unwilling to admit that the march of cholera and yellow fever may be thus arrested, though the eruption and extension of these maladies obey laws that are identical with those which influence the origin and spread of the exanthemata.

After all that has been written on yellow fever, it could hardly be expected that the writers of the above works would be able to throw much additional light on the subject. The ponderous work of Dr. La Roche contains what was much wanted—a chronological digest of the opinions of most of the principal writers on yellow fever, down to the present time, and we are bound to say he has performed his task with as much fairness as we had any right to expect from a partisan writer. The second book consists of four reports and a mass of testimonial evidence collected from various sources by the Sanitary Commissioners of New Orleans. The first, On the Sanitary Condition of the City, is by Dr. Barton; the second, On the Sewerage of New Orleans, by Dr. Riddell; the third, On the Origin and Spread of the Epidemic in 1853, by Drs. Anson and McNeil; and the fourth, On Quarantine, by Dr. Simonds. To these gentlemen the duty of investigating the subjects referred to appears to have been delegated by the municipal authorities.

From Drs. La Roche and Barton we have a long description of the physical condition of their respective cities. According to the former—

"Philadelphia in its totality is one of the neatest and cleanest towns in America; the streets are wide and well paved. Nevertheless there are in other parts of the town a number of lanes and courts, which are inhabited by blacks and the poorer classes, and often present a melancholy picture of filth and wretchedness. These, as in other towns, have always been infested with yellow fever. . . . In this almost isolated neighbourhood we find an excess of vagrant population, half fed and half clothed, crowded together in almost untenable houses and crowded cellars. In this forbidding district the half-famished and bloated bodies of a depraved and mixed population, whose constitutions have been undermined through the ravages of intemperance and exposure, the accumulation of filth, and impure food and air, become the fit receptacles, and afford the materials for the growth and reproduction of the morbific germs which produce disease."*

New Orleans in its "totality," on the contrary, is one of the dirtiest,

* La Roche, vol. i. p. 8.

and consequently the sickliest, city in the Union—at least, so says Dr. Barton. It is not only the sickliest city in America, but in the whole civilized world; while the municipality, if we are to believe the same authority, are even a more obstinate, pig-headed race of men than the much-abused rulers of another city on this side of the Atlantic.

Philadelphia appears to have been visited at distant periods by many yellow fever epidemics.

"Scarcely had a few hundred families from the mother country clustered together and provided themselves with comfortable dwellings, before an epidemic fever broke out among them, spreading desolation all around, and producing a mortality fully equal to any that has occurred at future times. The city was then about seventeen years old, and was little more in point of extent than an ordinary country town. Houses were scattered in various directions about the plot, and the creeks, pools, and swamps were such as nature had made them."*

There was then no excess of vagrant population, half-fed and half-clothed, crowded together in narrow streets and pent-up courts, badly ventilated and lighted, offering a fit pabulum for the disease to feed on. Neither were there accumulations of filth or foul drains to give rise to it. Yet it raged as fatally as it did in later years, when the city became filled with every kind of abomination. The chroniclers of this epidemic are silent with respect to its cause; and as it did not extend into the country, Dr. La Roche, for once, wisely abstains from assuming that "*there must have been an epidemic condition of the atmosphere;*" "and nowhere," he says, "so far as I have been able to ascertain, do we find a suggestion that any vessel had arrived from the West Indies in a condition calculated to infect the city;" yet, on the same page, he admits that one Pemberton had positively stated, on information from his father, that the disease was imported in a ship from the island of Barbadoes. The cargo consisted of cotton bags, which were landed on a wharf, and there stored for sale.

"The correctness of the inference," he adds, "will not acquire probability when the reader is told that Pemberton's father was only fifteen years of age at the time of the calamity. Though he was capable of making his remarks on occurrences, and afterwards remembering them, he knew it to be the invariable judgment of the physicians and other citizens that the disease was introduced among them in the manner narrated above, attributing it to no other visible cause."†

For forty years afterwards, yellow fever did not again make its appearance in Philadelphia; but in 1741 it was, according to Lind, introduced by a trunk of wearing apparel belonging to a gentleman who died of the fever at Barbadoes. There was an epidemic in 1747, which was supposed to have been introduced by a vessel from the West Indies; and again in 1762 the disease prevailed in a more intense form. The few writers who have spoken of the latter, ascribe its origin to a foreign source; "for the time had not yet come when it could be admitted to originate from the baneful action of foul exhalations." After an interval of thirty-one years it again broke out with great severity, and "sent thousands to the grave. Nothing, so far as the weather and temperature are concerned, seemed, in the minds of the physicians or the public, to portend the occurrence of a calamity so dreadful;" but Dr. La Roche tells us that "observations collected in subsequent years, and in other places, have taught us to connect the development of yellow fever with the existence of atmospheric peculiarities and conditions of the localities such as were noted at the time."

* La Roche, vol. i. p. 16. † Ibid. p. 53.

Whether the same care was taken to ascertain the atmospheric peculiarities which took place during the preceding thirty years, when the disease did not exist, we are not informed. It is, however, rather amusing to read over the peculiarities so industriously collected by Dr. La Roche. The weather, he says, was sometimes calm, sometimes unusually hot; and there was something (which is not described) in the heat and drought that was uncommon:

"The wharves and docks were more or less filthy; on one of the former there was a quantity of damaged coffee deposited—its smell was highly putrid. Mumps had prevailed, and scarlatina anginosa had also appeared. Peremptory orders were issued to have the streets properly cleaned and purified, and the filth removed. Still, long after this, the disease continued to spread until it prevailed in most quarters of the city, every street appearing to be charged with the miasmata. The inhabitants residing in densely-populated close alleys were the greatest sufferers."

This, most assuredly, would not lead us to infer that the disease sprang from the effluvia arising from putrid coffee and other matters, but rather that it crept from one house to another, and to street after street, by the extension of the exciting cause successively developed in those attacked, until, in the course of about three months, it extended over all the more densely-populated parts of the town, and swept away upwards of 4000 of the inhabitants. That a catastrophe so horrible should be ascribed to an atmospheric cause which has never yet been discovered—to a concourse of circumstances neither described nor understood—or even to filth of the worst kind, are theories which we are unable to adopt.

In 1794, the disease was introduced by a vessel from St. Mark. In 1795 and 1796, there were sporadic cases. In 1797, the fever was more general, but less fatal, than in 1793. The College of Physicians thought it was imported. The non-contagionists, on the other hand, ascribed it to local impurities, though it did not appear in some of the worst parts of the town, near which the foul drains of the city empty themselves.

"As on former occasions, the members of the medical profession suffered severely: out of three- or four-and-twenty who had attended patients ill of the disease, sixteen were attacked, and nine died."

In the following year there was an epidemic, which, in point of malignity and mortality, was the most extensive of any that had yet occurred in the city:

"It afforded the last great manifestation of the epidemic constitution of the atmosphere. There was plentiful rain at one time of the year, and a snow-storm about the middle of April. The intense heat of summer came on suddenly in May; the thermometer rose as high as 84°; but this spell was short. In June, the weather was warm, though variable; in July, the heat became considerable; throughout August and September, the weather was marked by high temperature: but on the whole, it does not appear that the mean temperature for the warm months was more than a degree or so higher than it had been since the days the city was founded; and the extreme heat at any time not greater than on other seasons, both at Philadelphia and at other localities in the same region, and elsewhere, where yellow fever has never been known to exist."

It is utterly inconceivable how a man of Dr. La Roche's good sense could, on such slender grounds, venture to impute to these salutary changes, which are common to every region within or bordering on the

Tropics, the power of originating an epidemic. A conclusion so illogical —irrational, we had almost said—is discreditable to medical science and damaging to the cause of truth. The consecutive eruption of the disease in one part of the town after another, shows that it depended on causes totally distinct from meteoric changes; for they could not have been dissimilar in streets and districts contiguous to each other: "It began about Spruce and Walnut-streets, early in August, but before the close of the month spread to nearly every part of the city." On this occasion, and this only, the disease penetrated into the gaol, situate at the corner of Sixth and Walnut-streets. In a population of 60,000 inhabitants, 4868 were attacked; and of these, 3645 fell victims to the malady. In 1802, 1803, and 1805, there were epidemics, and the usual differences respecting their origin were reiterated. The non-contagionists, to account for the last, pointed to a bed of putrid oysters, which emitted a stench from June to the end of July, when they were removed or destroyed, but the fever did not cease until the cold weather set in.

Sporadic cases occurred during 1806-7-8 and 1809, but after the last-mentioned year, the fever entirely disappeared. In 1812, however, typhus of a malignant character usurped its place; many of the citizens fell victims to it, and, amongst others, the illustrious Rush. Whether this malady was supposed to have originated from the same causes which gave birth to the yellow pestilence, we are not informed, but its communicability was not doubted; and its progress from person to person and from place to place was, in every respect, identical with the latter. During the next fourteen years, many of the populous towns of the Union suffered, but the fever did not again appear in Philadelphia until 1820. Jackson, and others of the non-contagion school, ascribed this invasion to a wet spring and the filthy condition of the town; while the contagionists traced its origin to a vessel which came from St. Jago de Cuba.

A third of a century now passed away before the pestilence again made its appearance; but in 1853, "during the prevalence of an epidemic condition of the atmosphere, which," according to Dr. La Roche, "extended over all the West Indian islands—Launceston, New Orleans, Mobile, Natchez, Vicksburg, and even Brandywine"—wherever the disease appeared, in fact, "it broke out in our midst, and attacked a considerable number of individuals, of whom about 128 died."

Its origin was, by some individuals, ascribed to unwholesome gases arising from putrid masses of animal and vegetable filth; while others, who could not, or would not, admit that any combination of gases had the power of producing yellow fever, traced it to the barque *Mandarin,* which had arrived from Cuba. Such is a brief history of the epidemics of Philadelphia. It will be observed that, with hardly an exception, each epidemic was preceded by the arrival of one or more vessels from an infected port, and to these arrivals the contagionists ascribed the introduction of the disease, which subsequently spread from the ship or person in connexion with which or whom it had been imported; while the non-contagionists were never at a loss to find out accumulations of filth, which, in connexion with an assumed epidemic condition of the air, they considered amply sufficient to account for its origin and also, we must presume, for its continuance for months afterwards, notwith-

standing the removal of filth, and the continual changes which took place in the atmosphere.

From Dr. Barton's Report we do not glean much that is interesting respecting the epidemic which prevailed in New Orleans in 1853. He also attaches great importance to meteorological—if not to astrological—phenomena, as originating causes of the malady; hence he has paid great attention to the state of the weather, the oscillations of the thermometer and barometer, the dew-point, the amount of rain, the winds, and what he terms "solar radiation." February, March, April, and May, so far as we can judge, were not marked by any unusual or unseasonable meteorological occurrence; but he affirms that

"The high combination of heat and moisture with so small a precipitation, together with a remarkable elevation of solar radiation, so early even as January, assured me that the climatic influences were very remarkable; and when I saw the filthy condition in which the city was—the great extent of the exposure of the original soil of the city, for gas, water, and other purposes—the digging of the Carondolet basin, the cleansing of the canals, and the embankments and excavations for railroad purposes; and the reflection on the fatal consequences that these had heretofore always brought on our city, with the chart A. before me,—this early connexion of the atmospheric element with the physical showed in the combination a foreshadow of what was to come, and enabled me to give a warning as early as the middle of May, in the Academy of Sciences in this city, of the disastrous consequences that were to follow, and to some scientific correspondents."*

We give the above passage as it is printed, as we are at a loss to discover the writer's meaning. That a high combination of heat and moisture, with so small a precipitation (of heat and moisture?), together with the elevation of solar radiation occurring in June, enabled Dr. Barton to predict an eruption of yellow fever in July, implies an amount of prophetic wisdom which we cannot accord him; from the state of the weather in January, he could no more predict an epidemic invasion of yellow fever in June, than he could, from the same premises, predict an eruption of Mount Vesuvius on the year following.

The Report on the Origin and Spread of the Epidemic, by Drs. Anson and McNeil, contained in the Report of the Sanitary Commission, is a cleverly written paper. Like Dr. Barton—though in more intelligible language—they endeavour to trace the fever to domestic sources. They say the first cases appear to have been contracted amongst the shipping, though other cases occurred shortly afterwards in three separate localities in the town. These latter cases, the writers think, show the presence of some general and wide-spread agencies operating in that locality, and repeating at different and distant places similar phenomena to those transpiring in the vessels.

"These local influences, it would seem, were more concentrated in one section than in others, and by their action induced a condition which might be properly called one of morbific atmospheric saturation. The locality retained this bad pre-eminence, though it cannot fail to be noticed that the fever seemed to spread thence to other sections of the city. Whether it extended by the migration of certain atmospheric influences, or through the agency of the sick, our evidence is most conflicting. If we look at the epidemic in its totality, at the wide-spread surface of country over which it was diffused, the mind cannot fail to discover a conformity to the well-known habits of epidemic diseases. Nothing that we

* Report, p. 231.

know of the most virulent contagions will favour the opinion that they can, in so short a space of time, commence, progress, culminate, and decline over an extent of country so diverse and separate as that which fell subject to the dominion of our late pestilence."*

Dr. La Roche, on the other hand, as we have elsewhere noticed, considers that the disease being generally confined within narrow limits, is a proof of its not being communicable by personal emanations.

Let us now for a moment glance at the Report on Quarantine by Dr. Simonds, also included in the Report of the Sanitary Commission. The author remarks, that—

"Whatever he thought of the contagiousness of yellow fever in general, or as it has prevailed, here or in other places at various times, it would appear to admit of no doubt, that the epidemic of 1853 was carried by the regular course of travel to the interior. Its progress was steadily directed to points of more direct commercial intercourse throughout the south-west; and it appears that, having once obtained a fast hold in any locality, this served as a new focus, from which it was still farther diffused. It does not appear to have followed any of the known laws of the diffusion of gases, nor to have established any other law of diffusion than that above indicated."

He next refers to the city being dependent on commerce for its existence, and the danger of reporting the presence of malignant disease; for the press, the news-boys, hotel-keepers, and merchants, take the alarm in decrying any one who will dare to announce a case of yellow fever. It is not, therefore, surprising that physicians should hesitate to record early cases; "the only wonder is, that any can be found daring enough to face all these influences with an honest expression of opinion." We fear there is too much truth in this, and that our transatlantic brethren, with all their boasted liberty, are but too frequently compelled to regulate their views and opinions according to the will of a domineering democracy.

On referring to the reports respecting the shipping, we find that a steamboat took the ships *Augusta* and *Camboden Castle* in tow at the mouth of the river; the former was direct from Jamaica, where she had lost seven of her crew by yellow fever; the latter was from Bremen. While coming up the river, the steamer being between them, there was free intercourse between the crews and passengers of both vessels. On the 17th of May, the *Camboden* was anchored near the *Niagara*, *Saxon*, and *Harvest Queen;* while the *Augusta* was carried higher up, and placed near the *Northampton*. On the 23rd of May, an indisputable case broke out in the latter. Shortly afterwards, cases occurred in the three vessels lying near the *Camboden;* and a man named Hart, who had been employed in the *Northampton*, sickened about the 30th of May, and died on the 10th of June. His skin turned yellow; but the absence of black vomit led some to assert that he died of bilious pneumonia. Before going to the hospital, he lay sick in a house near the Mint, which immediately afterwards became a focus of infection. Another man, named Dorrell, after working for many days in the *Northampton*, was attacked in a different district; and in quick succession, five others living in the same house were seized. The fever then spread rapidly over the locality. These,

* Report, p. 493.

so far as we can make out, are the principal facts relative to the origin of the epidemic in New Orleans; but the attempts which have been made to conceal the first cases, and the unwarrantable assumptions relative to the influence of epidemic and other causes, render it difficult to arrive at the truth. The appearance of the disease, however, first amongst the men employed in the vessels which had communication with the *Camboden Castle;* and then, secondly, on shore, in the very spots where the labourers and others who contracted the disease in the vessels subsequently suffered, and not in other parts of the town, accord so well with previous observation, for instance, with the introduction of the fever into the islands of Ascension, Boa Vista, Fernando Po, and Goree, and also into Philadelphia, from the first down to the last epidemic, that we hardly believe it possible for any man who has the courage to think and write according to his own conscience and conviction, to deny that they do not afford strong and reasonable proof of the introduction of the fever by the shipping.

Dr. Barton is evidently well satisfied with the knowledge he possesses of the etiology of yellow fever. He supposes it to depend on the junction or meeting of two causes—the one atmospheric and the other terrestrial; and that it is in the power of man to control these agencies, and so prevent the evolution of the fever.

"If," he says, "the preventives and remedials we have recommended be seasonably and rigidly enforced, they will not only forestall and prevent yellow fever from originating here, but from propagating, should it be brought from abroad."

"Let me," he says, "be understood. I do not say that all the causes to which we assign the production of yellow fever can be forestalled in their coming, or expelled when they do come, by any human agency; for the meteorological conditions of elevated temperature, excessive saturation, great solar radiation, large precipitation, and prevalence of particular winds, or the absence of all winds, may not be entirely preventable or remediable by the art or the power of man. But great as the influence we attribute to the presence of these most deleterious and alarming agencies, we nowhere attribute, nor wish to attribute, to these agencies alone a capacity for originating or propagating that disease. It is only when they are in *combination* with those morbific influences which we have denominated *terrene* (which embrace every species of noxious affluvia which filth of every description and disturbance of the original soil generates and transmits), that the etiological conditions exist for the production and spread of the pestilence. The terrene condition alone is without the power to originate the disease in the absence of the meteorological conditions."

On this we would observe, that yellow fever has raged in towns and localities which were entirely free from every "species of noxious affluvia," or effluvia; while, in other places abounding in filth and corruption, it has never made its appearance. We may instance Sierra Leone, the islands of Ascension and Fernando Po, on the one hand; and the towns and cities on the estuary of the Canton and Yang-tse-Kiang rivers, on the other. In the former, we know, from personal observation, from the paucity of inhabitants, and the total absence of factories, that there never were, nor could have been, accumulations of filth; while in the latter, where the inhabitants are numerous and live closely-packed together, it is carefully stored up as one of their greatest treasures, yet yellow fever has raged with virulence in the former, but has never made its appearance in the latter.

In a chapter dedicated to Applicata, Excreta, &c., Dr. La Roche

hazards some remarks with respect to the influence of localities in producing yellow fever, with which we are unable to agree.

"It is impossible," he says, "to shut our eyes to the fact that the localization of yellow fever takes place only or principally where certain peculiar combinations of the materials appertaining to the soil, or which may have found their way there accidentally or otherwise, are discovered; that it takes place also in houses, rooms, yards, &c., where we meet with certain conditions of circumstances connected with the population, or where the objects by which they are surrounded, and which are known to be inimical to health, exist,—offensive effluvia, putrescent food, foul water, imperfect ventilation, besides some of the agencies already dwelt upon. Bearing this in mind, we arrive at once at the conclusion that the real cause, whatever it may be, meets there certain agencies which so modify the system as render it liable to the morbid impress. In a word, what may be regarded as the active and efficient cause of yellow fever may, after all, be but a predisposing agent."*

That offensive effluvia, putrid food, and bad ventilation are inimical to health, and predispose to disease, no one will deny; but we cannot admit that these are the only or principal conditions under which the localization of yellow fever takes place, or that there is any proof on record that it ever broke out spontaneously in any region or locality, however modified by conditions and circumstances, unless there had been either direct or indirect communication with another locality where the disease existed; and however great the predisposition may be which noxious effluvia and bad water or food impart to the system, no writer of respectability ought to hazard the opinion, that the active and efficient cause of the fever may, after all, be only a predisposing agent. It is to these groundless speculations, apparently advanced from a morbid desire to reason on subjects we do not understand, that the unsatisfactory state of the questions of quarantine and contagion is entirely to be attributed. Whether Dr. La Roche has any correct views with respect to the influence of what he calls the combinations of materials of the soil, or with respect to the certain conditions of circumstances connected with the population, we cannot discover; but it would be well if he and other writers of the same class would abstain from writing in ambiguous terms on questions which they do not and cannot comprehend.

"Yellow fever," we are told, "cannot be generated at a high elevation above the level of the sea, owing to the greater purity of the air, to a diminution of atmospheric pressure, and to more thorough ventilation. . . . . But the main cause is the absence of the degree of heat which is indispensably necessary for the elaboration of the morbific agent; for the same reason, in fact, its limits are restricted within certain bounds north and south by an excess of heat, and a variety of influences of a meteorological and telluric nature. . . . . Everywhere, a high range of thermometric heat has been found necessary to ensure its production, for whatever be the condition of the localities, the occurrence fails unless the temperature be high and continues to give a certain average during some weeks or months. . . . The connexion of high atmospheric temperature with the prevalence of yellow fever is universally recognised, not as regards one portion of these regions alone—but all."

This may to a certain extent be true, but there is this remarkable distinction to be made—that a high temperature is not invariably connected with yellow fever. We have the same conditions of the soil,

* La Roche, vol. i. p. 86.

similar accumulations of the same kind of filth, with an atmosphere which is universally the same in all parts of the world, yet yellow fever, with the exception of the Island of Ascension, had not, until within the last few years, made its appearance on the south side of the Equator; though it is now, in consequence of the rapid and frequent communication by steam, and the increase and extension of commerce, gradually extending southward along both sides of the American Continent, into regions where it had never before been known to exist. Will this have any effect in causing the rulers of civilized nations to institute an inquiry into the disputed question of contagion, by men—not physicians—who are capable of distinguishing facts from fiction—certainty from uncertainty? We fear not. In the present state of affairs, therefore, there is too much reason to fear that, in spite of the abortive attempts made to exclude the disease by ill-regulated quarantine restrictions, it will go on extending from town to town, and from one country to another, until it overruns the whole of the Polynesian Islands and the densely-populated towns on the shores of India and China. That yellow fever does not reach towns at a high elevation is hardly correct, for according to Humboldt, it has reached an altitude of 2500 feet above the level of the sea; still, the higher the position the greater the immunity. Why it appears less frequently in these localities may be owing to their having less communication with infected spots than those on the sea-level, to their being generally less crowded, and to the absence of heat.

Neither time nor space will permit us to notice a tithe of the causes set forth in Dr. La Roche's work as instrumental in the production of yellow fever. He appears to attach great importance to the opinions of some writers who consider thunder and lightning, shooting stars, and ozone, as probable predisposing causes; and elsewhere he alludes to damaged coffee, putrid melons, and rotten oysters as exciting causes. There is, in fact, hardly any change or phenomena, normal or abnormal, which has ever been observed in the material world, that he has not, in some way or other, connected with the etiology of the malady. For example, if electricity act according to Piclot, Maher, Rutz, and others, as an exciting cause; and according to others as a preventive, he arrives at the conclusion that "it may, and no doubt does, act as an exciting cause by its excess, and as a predisposing one more frequently by its deficiency and modification."

We were not sorry when we came to the tenth chapter of the second volume of Dr. La Roche's work, which treats of the Efficient and Immediate Cause of Yellow Fever; for here at last we thought we might hope to see some light thrown on a subject which deeply concerns so many of our fellow-beings living within the Tropics; for if, in reality, the efficient cause be fortuitously engendered in certain localities by some unknown change in the earth or the air—if it be not a morbid product of the human frame—then away with quarantine restrictions, and leave the arms of commerce unshackled to grapple with the evil as they best may. But if it can be shown, or if there be just grounds for deeming it even probable, that the fever is the product of an infectious virus which emanates from the living frame, then, in the name of humanity, let us endeavour by fair and honest counsel to warn the inhabitants of those regions

who have hitherto escaped, to guard against its introduction by every means which, in accordance with law and humanity, they can adopt. But notwithstanding the attractive title of the chapter, it contains nothing more than a tedious repetition of the opinions of other writers which were noticed in the previous part of the book.

There was, it seems, a time, before men's minds became bewildered and their tempers "*riled*" by the conflicting opinions of medical writers, when the contagious nature of yellow fever was universally admitted throughout the whole extent of the American coast, from the Line up to the Gulf of St. Lawrence. The simple people of those times observing that the fever did not attack the rural population unless they communicated with towns —that it did not originate in the interior and extend towards the coast —that it invariably appeared first in seaport towns, and amongst the population residing near the shipping—and that in almost every outbreak it was traceable to vessels that had arrived from infected ports—that its origin on shore was frequently traced to persons who had resided in or near the dwellings into which strangers had been received ill of the fever, and that these outbreaks followed each other after long "spells" of ten, twenty, and sometimes even of fifty years' duration—observing these occurrences to follow in the manner of cause and effect, and not dreaming that the winds of heaven, through some unknown process or change, could become charged with a specific principle inimical to health; or that their mother earth, pregnant with all that is beautiful and useful in the sight of man, could emit an agent inappreciable by our senses, yet so deadly as that which gives rise to yellow fever;—these simple-minded persons, we say, came to the conclusion that the fever was not indigenous, but that in each succeeding outbreak it had been introduced from abroad. Dr. La Roche, however, informs us that this delusion rapidly declined in America, and that the doctrine of non-contagion, arising from small beginnings, and numbering previously to 1793 amongst its defenders but few names of weight, gradually gained proselytes, and finally, in later years became the predominant doctrine. We are much mistaken, however, if the tide of opinion be not now rapidly setting in an opposite direction. The melancholy catastrophe of the *Eclair*, and the introduction of the fever into Boa Vista, opened the eyes of most men who were not blinded by prejudice or self-interest. Dr. La Roche, we are sorry to observe, finding that he could not dispute the conclusions come to by Dr. McWilliam on this remarkable case, and with a wholesome dread of losing caste amongst his quarantine-abolitionist friends in New Orleans, resorts to the discreditable alternative of affecting to doubt the facts, though they were substantiated by the whole surviving population of the island, by Dr. King, who afterwards went over the same ground, and by documents—the current records of the time—lodged in the archives of the British and Portuguese Governments.

In a chapter on the Contagious Nature of the Disease, a few of the more remarkable facts in support of the doctrine are briefly noticed, and the opinions of the more notorious writers of the Pym school are faintly traced, but in a way which might lead to the conviction that, after all, Dr. La Roche has no settled opinion on the question of contagion. In one place he brings forward the most unexceptionable proofs of the com-

municability of the fever, and, as it were, challenges the reader to deny them; in another he ridicules his credulity, and charges the whole fraternity of contagionists with want of candour and truth. "The communication of the disease from the sick to the well, may," he says, "in general, be traced in a satisfactory manner. In other instances the fever is found to be due to exposure to articles of merchandize, to clothing and bedding impregnated with the seeds of contagion." "The contagion has been carried to distant villages and towns, and to public establishments situated in parts of the city which otherwise remained free from the calamity." A number of cases in point are detailed, convincing enough, one might suppose, to induce those who advocate the abolition of all protective measures to reconsider the question, lest they prove instrumental in upholding a doctrine which, if we are to believe the stories of the *Bann* and *Éclair*, is fraught with an incalculable amount of misery to the human race.

Dr. La Roche contrasts the cessation of yellow fever in cold weather with the cessation of fevers arising from marshes; this coincidence, he conceives, furnishes additional proof of the non-contagious nature of the former. The fevers, he says, though not identical, are closely allied, and are everywhere under the influence of certain hygrometrical conditions of the atmosphere, are due to the action of domestic causes, and are universally admitted to be void of contagious properties. "Every one, from the learned physician to the gossiping granny, knows full well that cold weather is sure to be marked by a cessation of the fevers in question." The extinction of yellow fever by cold we believe to be an undisputed fact, which has not, and perhaps cannot, be explained; but our learned author goes on to state that the same beneficial change is produced through other agencies—copious rains, heavy winds, especially from the north, desiccating and long-continued heat and drought; and that at times it is brought about by a change in the epidemic meteorization, the evolution of ozone, &c. As he does not inform us on what grounds he has formed these opinions, and as he elsewhere attributes the evolution of the disease to the same agencies, we have little hesitation in again ascribing these notions to his not having any settled opinions respecting epidemic meteorization, ozone, or even of the disease itself. There is a looseness in his modes of reasoning, and an abuse of scientific language, which we imagine may be traced to vanity, or a wish to appear learned in matters on which wise men are not ashamed to confess their ignorance. Sydenham, speaking of the kind of atmospheric constitution in which certain morbific influences are supposed to be developed, justly observes that "they are points on which we must be contented to plead ignorance. They are matters, like many others, upon which vain and arrogant philosophy speculates to no purpose."

We confess to our having been rather startled on being informed by Dr. La Roche that he had at hand eighty-nine authorities from which he could quote evidence to prove that yellow fever depended on a distempered condition of the atmosphere, and not on contagion. We can only find room for a few of these valuable proofs: there was a gentleman who informed Dr. Barton "that when yellow fever prevailed, his cauliflowers, cabbages, and radishes would wither and die." "Judge Selby's fig-trees did not produce so many figs as usual." These occur-

rences, he conceives, show that yellow fever allies itself to diseases originating from a general distemperature of the atmosphere—the effects of malarial influence—while it recedes from those of a contagious character.

But still more striking is the effect of the insalubrious atmosphere on animals. "Early in June, 1805, cats began to droop and die. Dogs also were severely and fatally affected. Next year, cats were again affected, as well as rats." "Many of the cats died numb and torpid, while others were seized with delirium and puking."* Even fish and oysters are known at times to participate in the same calamity. In 1798, flies were found dead in great numbers in the unhealthy parts of the city. "At Gibraltar, in addition to dogs and monkeys, a goatherd lost a great part of his flock, and almost the whole ceased to give milk." At New Orleans, in 1833, there was much sickness amongst horses, cattle, and swine. Again, "in 1819, they died with rotten tongues, and sheep and dogs with their hoofs dropping off, and calves with rotten ears."† These are very horrible revelations; and, if our readers do not deem them sufficiently confirmatory of Dr. La Roche's views, we must refer them to the work itself, where they will also find some remarks of equal value in an etiological point of view, on a well-known and fatal disease in the highlands of Scotland among sheep, termed "braxey."

Respecting the local habitation of yellow fever, its sphere of prevalence, we are told, is always somewhat, and on some occasions very, circumscribed, the disease remaining confined within the limits of the localities where it originated. In Philadelphia its ravages were generally confined to a few streets, and the same peculiarity was observed during the epidemics which assailed the inhabitants of New York, of Baltimore, and other cities of the Union; it often seems to affect, in preference, a particular building, a particular side of a street, or a particular part of a house. In Martinique, the patients in the Military Hospital suffered six weeks before the disease extended to the neighbouring houses; it sometimes attacked one vessel in the port, and then jumping over several, committed its ravages in others moored at a distance; even small localities and single houses, situated in the midst of an infected district, sometimes escape. From these circumstances, Dr. La Roche considers he is justified in drawing a conclusion favourable to the doctrine which ascribes the fever to some specific cause existing in the locality, and adverse to its contagious property. We differ from him; in the first place, because these are the characteristics which belong to small-pox and other contagious diseases, and not to the endemic remitting fevers of hot countries; secondly, if the originating cause of yellow fever depended on the combination of atmospheric and terrestrial agencies, the fever would make its appearance in several places in the same locality about the same time, instead of originating in one house or family, and then slowly extending, after the lapse of weeks, to others within a space not exceeding eighty yards. Remitting fevers do not remain within circumscribed limits, but occur scattered over an expanse of country. For instance, throughout the whole extent of the delta of the Niger, or the valleys of the Canton and Yang-tse-Kiang rivers, showing that they depend on a cause peculiar and common to these and similar regions. Contagious fevers break out in isolated spots, and

* La Roche, vol. ii. p. 316. † Ibid., p. 317.

radiate in lines corresponding with the lines of intercourse which are most frequented by men, showing that they depend on a cause which requires the human frame for its elaboration. A gap in the line of communication will arrest the extension of the disease in the same manner as the boundaries of a marsh limit the extension of periodic fevers. The periodic fevers of hot countries are most destructive in fens and jungles—they do not exist in the filthy stews of New Orleans, but the yellow fever germs, when once introduced into these sinks of human depravity, find the fitting soil for their evolution and reproduction.

The late Board of Health of London had a way of arranging isolated facts which led to conclusions that were erroneous and delusive. It presented to the public, in the form of a Blue Book, an account of all the filthy towns throughout England in which cholera prevailed, for the purpose of proving that filth and its products—foul effluvia—were the cause of the disease. Reasoning upon the facts given, the conclusion seemed to be inevitable; but had the names of places in which the disease raged, which were not in a filthy state, been placed in apposition, and if to these had been added the names of other towns into which the disease did not enter, though steeped to the eaves in filth and wretchedness, the conclusion would have been, that, however destructive of health filth may be, it had no direct influence in originating the epidemic. This singular body, with its characteristic modesty, next astonished the legitimate members of the profession by a Report On Yellow Fever, so arranged that, in the whole of the extracts, there was not to be found one grain of evidence that did not weigh in favour of the doctrine of non-contagion. We would hardly have noticed these productions here, were it not that abroad they appear to be received with the respect due to the writings of professional men. They are frequently quoted by Drs. La Roche and Barton; the works of both these authors, in fact, appear to have been drawn up on the same plan, and, as it were, for the purpose of swamping, by a torrent of selected evidence, the facts which establish the communicability of yellow fever on grounds that cannot be disputed. The former has devoted sixteen chapters to proofs against contagion; these proofs consist principally of extracts, tending to show that cases of yellow fever may be introduced into a healthy locality without the disease spreading. Evidence of this kind, unless for the purpose we have mentioned, is of no value, even if it were multiplied a hundredfold, for the same kind of evidence might be adduced to prove that small-pox and scarlatina are not contagious; it simply proves that, in these particular instances, the fever did not extend. It is hardly conceivable that any man of ordinary information could have fallen into an error so palpable as to suppose that, if the fever were contagious, it ought to spread in every instance. As well might we assume that the electric bolt is harmless because it does not always kill, or that the burning brand which falls amidst combustible matter is not fire because it fails to set the latter in a blaze. Speaking of the epidemics of Philadelphia, and entirely ignoring all that he had previously written respecting the contagious nature of the disease, he states that he is not hazarding too much when he affirms, that yellow fever has not been propagated to other towns or cities by the removal of persons labouring under it, or by their effects; and that the result in other cities of the States has been of a kind to confirm fully the

experience there obtained. After detailing a number of instances in which no fever followed, notwithstanding the unrestricted communication with infected districts and persons, he next alludes to others which the contagionists have laid hold of as evidence of undoubted communication. With respect to the former, they are admitted on all hands as facts which have been placed on record by men of unquestioned veracity; even Pym, the most truculent of all the contagionists, dead or living, would respect them for what they are worth. With respect to the latter, he either derides the evidence as not being credible, or sets it aside on the grounds of there having been dirty water, accumulations of filth, or foul effluvia, at hand when the disease made its appearance; or, he affirms that the locality, "under particular meteorological conditions," was prolific of fever. So frequently are the changes rung on these cabalistic phrases, that at last we almost unconsciously admit that there may be some meaning attached to them. But with every respect for the opinions of Sydenham and other distinguished writers, we cannot help thinking that, within the last thirty years, particularly in reference to cholera and yellow fever, they have been used in a most improper manner, and not unfrequently as a cloak to hide our own ignorance. The atmosphere may be warm or cold, damp or dry, but these are the only conditions peculiar to it which have any influence on health. Emanations from the living, labouring under contagious diseases, produce the same kinds of disease, and gases or effluvia of local origin may impair the general health, but they do not give rise to special epidemics.

Writers who, like Drs. La Roche and Barton, affect a kind of transcendental knowledge respecting the causes of disease,—who assume that they *may* be traced to unknown agencies and to physical changes in the elementary conditions of matter, should be prepared to explain the nature of these, or to offer some kind of proof in support of their assertions that such changes really do take place. If, however, we reflect, that for ages it has baffled the skill of the best analytical chemists to detect any cause or agent in the atmosphere to which epidemic diseases might be ascribed, we shall be the better able to appreciate the value which ought to be attached to the hypothetical assumptions with regard to the evolution of a specific aërial cause of yellow fever, put forth by such writers as Drs. Barton and La Roche. The latter affirms that, of all the instances produced in proof of the propagation of yellow fever from cities in America to other cities, towns, and villages, more or less distant, not one has been satisfactorily made out. We have arrived at a contrary opinion; and further, we have an idea that the proofs are so satisfactory, that they can hardly be more conclusive, unless the efficient cause itself be made demonstrable. We have already stated that the question cannot be determined by negative proofs, though these should outnumber the stars in heaven; but one fact of a positive character, such as the communication of the disease to the garrison of Ascension by the crew of the *Bann*, or the communication of the fever by the crew of the *Eclair* to the islanders of Boa Vista, decides the question at once and for ever. The first occurrence shook the fragile structure of the non-contagionists to the base, and the latter scattered it to the winds. They may affect to disbelieve Sir Wm. Burnett on the one hand, and Dr. McWilliam on the other, but they cannot alter the incontestable facts.

The crews of these vessels contracted yellow fever at Sierra Leone; the first ran to Ascension, and landed her sick; the second to Boa Vista, where she did the same. Yellow fever had never existed in either island before, but immediately after their arrival it broke out, and raged with great severity for several months, and then entirely ceased. Twelve years afterwards—namely, in 1837—the *Ætna Raven* and *Forester* arrived at Ascension, with their crews ill of the disease; and shortly afterwards the fever again broke out in the garrison, and swept away a large number of persons; but since that time it has not made its appearance. In 1829, the *Hecla* and *Scout*, with yellow fever on board, arrived at Fernando Po, and landed their sick; immediately afterwards it broke out amongst the settlers, though a case of the disease had never occurred in the island before. In 1837, the brig *Forester* landed yellow fever patients at St. Mary's, on the Gambia; the inhabitants were immediately attacked, though the fever had never before been known to exist there. In a community so small it soon became extinct; and has not, up to the present time, again made its appearance. From the Gambia, it was carried by a small trading vessel to the island of Goree, where it attacked a large number of the inhabitants, and then, in the same manner as in the places already mentioned, it entirely ceased; the contagious germs which had escaped from the last cases were scattered by the winds, and from that time to the present day, yellow fever has been unknown in the island. These and numerous other instances, all equally conclusive as to the introduction of the fever into islands and localities where it never before had been known, could not have escaped Dr. La Roche's notice; yet, with a marvellous disregard of the consequences, he coolly advocates the abolition of protective or even precautionary measures, with the view of restricting its extension.

We have already mentioned Dr. Barton's views respecting the cause of yellow fever—namely, that it is an agent which is produced or generated by the junction of two other imaginary agents,—the one of an aërial, the other of a terrestrial nature; these he compares to the blades of shears, which he calls "my shears," or "the shears of fate." When apart, *they* are harmless or inert; but when they meet, without the help even of an encouraging *hey, presto,* the true excitant of yellow fever is produced. Unfortunately for the Doctor and this theory—which is nearly as old as the hills—no evidence can be adduced of the existence either of the generating or generated agents; they are mere myths which do not assist us in accounting for the prevalence of the fever in one part of a town and not in another, or for its sudden appearance in distant ports and places after the arrival of infected ships or persons—occurrences, we conceive, which can only be explained by assuming that it originates and spreads in the same manner as other contagious diseases.

Dr. La Roche has evidently been greatly puzzled in his selection of an efficient cause. He sometimes adopts Dr. Barton's blades, acting in conjunction with "certain conditions and combinations" of other elementary matters; while, at other times, he rejects the idea of any of these agents, whether singly or combined, aërial or terrene, being capable of producing yellow fever. The poison, he says, is not precisely similar to that of other malarial fevers, though it is of miasmal origin. It does not arise

from animal decomposition; but considering the influence of vegetable decomposition in the production of periodic fevers, he finally adopts the views of Dr. Wilson, who refers "the origin of the exciting cause of yellow fever to ligneous decomposition; for though these organic compounds may not be discovered on the surface, they assuredly exist beneath." The facts, he says, adduced by Dr. Wilson, "recommend themselves in many ways, by furnishing evidence amounting, so far as it goes, to prove that ligneous decomposition is, if not the unvariable, at least a frequent, and in many places the only, cause of the disease."

We shall now take leave of this question by merely remarking that yellow fever does not, as a general rule, prevail where the products of vegetable decay are most abundant,—as in the valleys of the Nile, the Niger, the Ganges, the Yang-tse-Kiang, or even of the Nicaragua; while it has prevailed with great virulence in localities which are comparatively free from them—as, for instance, on the island of Boa Vista, at Stony Hill Barracks in Jamaica, and on the Island of Ascension, where there is hardly a particle of vegetable mould or matter, either above or below the surface, the island being one mass of lava and ashes, the products of volcanic fire.

Of the fourteen hundred pages of Dr. La Roche's work, about one hundred are devoted to treatment; they are the pennyworth of bread to the enormous amount of sack which precedes them, in the form of proofs for and against contagion; they, in fact, contain all that is sound and practical in the work.

Adverting to the various modes or fashions which have prevailed at different times, according as the fever was viewed to be of a typhoid, putrid, bilious, or of an inflammatory character, he says, the fever, in a therapeutical view, may be divided into three categories:—The 1st comprises those in whom the poison has produced a deadly impression; 2nd, those who are so mildly affected as to recover without any treatment; 3rd, those in whom the disease assumes an intermediate grade. We have already noticed that these differences are sufficiently distinctive for every practical purpose, whether with respect to the treatment or classification. It is, however, obvious that the treatment suited to each variety, as well as to accidental complications, will vary very considerably, so that rules cannot be laid down as applicable to particular cases, either singly or in series. We must content ourselves with endeavouring, not to neutralize the poison circulating in the system, but to correct the morbid effects it occasions both on solids and fluids; we must guard against mischief being done to vital organs, reduce undue and dangerous excitement, and sustain the powers of life when reduced below the point of safety; but beyond this, art is of little avail. The idea of curing the disease is a delusion. To nature and time the cure must be left; and in cases marked by no organic mischief, the physician will do well to keep his hands off, and restrict his agency to the employment only of such means as are necessary to relieve the symptoms; more danger is to be apprehended from too great than too little interference. There are few who have seen much of yellow fever, who will not admit the salutary counsel contained in these remarks, which we have epitomized from the twenty-third Chapter.

In the inflammatory varieties, antiphlogistics and evacuants are indispensable in the first stage, but care must be taken to graduate their energy to the force of the circulation, the heat of the skin, and the extent of the local inflammation or congestion. In endeavouring to relieve these, we should not lose sight of the necessity of husbanding the strength, while we avoid everything calculated to depress the powers of life. In the more severe forms of the disease, practitioners need not place their principal reliance on the lancet; for, as a general rule, the milder and less debilitating method will be the safer. The rapid and copious abstraction of blood tends to hasten collapse, and thereby places the system in a condition from which recovery is always doubtful. Dr. Barton sometimes drew 70 ounces of blood at one bleeding, and in the course of twelve or eighteen hours afterwards, from 10 to 20 ounces more; but the utility of this practice is justly questioned.

The employment of emetics, whether with the view of cutting short the fever or shaking it out of the system, gains no favour in the sight of Dr. La Roche. "They aggravate the irritation and inflammation of the gastric organs; they foster the disposition to vomit, which it is a primary object to relieve, and which, when once elicited, it is difficult, if not impossible, to control." They have been discarded from the treatment of yellow fever, and are only resorted to occasionally to meet peculiar contingencies. Purgatives from an early period have been used in America, and found advantageous under particular circumstances; they produce comparatively little irritation in the stomach; they expend their action on the intestines, which are but seldom in a state of irritation or inflammation. "As a general rule, it may be regarded as safe and proper to administer purgatives every day until proper and copious evacuations have been procured." Calomel purges are useful when given in moderation; they have a soothing effect, and are supposed to evoke bile, but "the physician must have other objects in view in the treatment of yellow fever, besides the excitement of the biliary secretion. It is not certain that the restoration of that secretion is much more essential than the cutaneous secretion;" and as mischief is often produced by attempts to force the latter, it is but reasonable to suppose that the same may result from heroic efforts to force the former.

We rejoice to find that Dr. La Roche disapproves of the mercurial plan of treatment.

"It is," he says, "acknowledged on all hands, and the fact is too evident to be denied, not only that patients labouring under severe attacks of the yellow fever recover under the use of mercury, but that it is occasionally the instrument of relief. But it is not the less certain also that mercury under all circumstances is an inconvenient and disagreeable remedy; it often produces effects of a highly painful, injurious, and dangerous character. And when we bear in mind that while trusting to this remedy we are allowing moments to pass which might be more profitably employed, we cannot refrain from the conclusion that it is imperative in us, before aiming at mercurializing the system, to ascertain whether the advantages derived from the process are likely to outweigh the objections to its use founded on the circumstances mentioned."*

There are a few remarks on the use of quinine, but they are of little importance; the author does not appear to have a clear conception of the

* La Roche, vol. ii. p. 666.

action of this medicine. Confounding the two diseases, he seems to think that it ought to have the same effect in yellow fever that it has in periodic fevers; but we have yet to learn that it has any influence on the system in the former beyond that of acting as a tonic.

REVIEW II.

1. *Clinical Lectures on Surgery.* By M. NÉLATON. From Notes taken by WALTER F. ATLEE, M.D.—*Philadelphia*, 1855. 8vo, pp. 755.
2. *Surgical Reports, and Miscellaneous Papers on Medical Subjects.* By GEORGE HAYWARD, M.D., President of the Massachusetts Medical Society, Fellow of the American Academy of Arts and Sciences, late Prof. of Surgery in Harvard University, and one of the Consulting Surgeons to the Massachusetts General Hospital.—*Boston*, 1855. 12mo, pp. 452.

"MY experience, since the publication of the preceding papers on the anæsthetic agents, has satisfied me of the correctness of the views I then took. If there be any change, it is that I attach more value to sulphuric ether, and have more perfect confidence in the safety of its inhalation than I had at that time. Of its efficacy I have no doubt. I have never in a single instance, during the last five years, failed of producing by it entire insensibility to pain, without causing much inconvenience in its administration, and without any serious or troublesome consequences afterwards. Nor do I find any evidence that it has ever proved fatal, though it has often been exhibited in a reckless and unskilful way.

"Nothing has occurred to change my opinion in relation to chloroform. Many additional cases of death from its inhalation have been published, and scarcely a medical journal comes to us from Europe that does not add one or more to the melancholy catalogue. It is wonderful to me that intelligent and educated men should continue to use an agent of such terrific power." (Hayward, p. 250.)

We have given such prominence to the foregoing statement of Dr. Hayward's opinion because of its weight, its severity, and the unqualified manner in which it is asserted. Dr. Hayward's was the second patient in the United States who inhaled ether for a surgical operation, and the first in whom the narcotism was complete. He has continued to use the same agent ever since, and his experience of its effects must now be much greater than that of any man on this side of the Atlantic. His voice, therefore, has a claim to be authoritative on the subject of its innocuousness. Our experience in Europe abundantly pronounces the harmlessness of chloroform in all healthy persons; and it is unlikely that the opinion we have quoted above will alter the recognised practice of European surgeons. Yet there are certain cases, more particularly those of disease of the heart and emphysema of the lungs, in which many practitioners fear to employ chloroform, but which may bear the administration of the ether without injury.

The work of Dr. Hayward is, in great part, a reprint of papers which have already been published, and some of which appeared as long ago as 1824, 1817, and 1815. The author has, we think, rightly judged that the "facts and tables, if collected together, might be read with advantage by students and the younger members of the profession, and would be consulted by practitioners who have little leisure for the examination of more extended works."

The first two papers are the reports of his surgical practice in the General Hospital at Massachusetts, for a period of sixteen months, and they contain various matters of surgical interest, from which we abridge the following:—

Inflammation of the Hernial Sac.—The author gives four cases of this unusual affection as having occurred to him within a period of eight months. In one of them, the sac was gangrenous; in the second, fibrin was effused in abundance, but no pus formed; in the third, suppuration took place; and in the fourth, the inflammation was so much reduced, that it no doubt terminated in resolution. All the patients recovered, for the sac being no longer of similar structure to the peritonæum, the inflammation did not extend beyond the hernial ring.

"A labourer, aged forty, states that he has had a rupture since childhood, easily and entirely reducible at all times; never any incarceration. Six days since, was attacked with pain, described as colic, about the umbilicus; got some cathartic medicine, which operated. Three days ago, hernia came down, and has not been able to reduce it since. Has been bled twice, and the taxis attempted by several, without success. Has not had much pain in the tumour. No vomiting. Salts operated yesterday. Now, pulse eighty-eight, of moderate strength. Tongue white; coat on lobes moist. No sickness or pain in epigastrium. Some tenderness in left iliac region; less in right. On the left side is an inguinal hernia, the size of two clenched hands, to the touch hard, without resonance. Integuments slightly reddened. External ring tightly girt around the neck of the tumour, which is remarkably large and firm. Some pain upon pressure. A purgative enema came away without operation. The taxis was tried in the warm bath, and the size of the tumour somewhat diminished. Ice was then applied to the tumour, and the bowels freely opened with a pill of jalap and croton oil. The next day, the scrotum was œdematous at the bottom, and the operation for hernia was performed. On opening the sac, a gangrenous odour was emitted, and the sac was in a gangrenous state, but nothing was found in it, and there was no stricture at the ring. In removing the sac, the tunica vaginalis was punctured, and two ounces of the water of a hydrocele escaped. No inflammation took place in the abdomen; the whole scrotum, together with testicle, swelled to five times the natural size; a copious discharge of bright orange fluid from wound, with escape of gas on pressure, probably from the sloughing of the cellular membrane; but the patient recovered completely, and was discharged well fifty-four days after admission." (Hayward, p. 25.)

These papers are followed by a long and interesting report of a committee of the American Medical Association, on the permanent cure of reducible hernia, in which the vast variety of plans for the closure of the unnatural opening is reviewed, and an unfavourable estimate formed of them all. Injection, cauterization, ligature, sutures, excision of the whole or of a part of the sac, seton, acupuncture, scarification, castration, the invagination of a portion of the scrotum into the inguinal canal, plugging the canal with lint, with a pouch of goldbeater's skin, with omentum, or with the inverted sac itself, closing the external ring by suture, by stitching to it a flap of integument, or by forcing the testicle into it, all are reprobated on some ground or other, and the conclusions at which the committee arrived, are embodied in the following three propositions:—

"1. There is no surgical operation at present known which can be relied on with confidence to produce in all instances, or even in a large proportion of cases, a radical cure of reducible hernia.

"2. They regard the operation of injection by the subcutaneous method as the safest and best. This will probably in some cases produce a permanent cure, and in many others will afford great relief.

"3. Compression, when properly employed, is, in the present state of our knowledge, the most likely means of effecting a radical cure in the greatest number of cases." (Hayward, p. 117.)

It is probable that a certain number of recent ruptures in young persons will be permanently cured by any treatment under which the hernial orifice is kept closed for a considerable period; but it is equally probable that there are many cases of inguinal hernia in adults also, which are susceptible of cure by the method of inverting a plug of the scrotum into the inguinal canal. The plan appears to have originated with M. Gerdy, and to have been modified by other surgeons; but no satisfactory mode of securing the plug of scrotum in its inverted position was obtained, until one was suggested by Professor Wutzer, which has been successfully practised and introduced to the notice of English surgeons by Mr. Spencer Wells. The ingenious instrument by which adhesion is secured between the inverted scrotum and sac and the inguinal canal, at a height sufficient to close the internal abdominal ring, is described in the 'Transactions of the Royal Medical and Chirurgical Society,' vol. xxxvii.

Passing over papers on the Diseases of the Knee-Joint, the Statistics of Amputations, and one or two others, we find 9 cases of vesico-vaginal fistula, for which Dr. Hayward adopted the practice of paring the edges, and uniting them by suture. He obtained the complete closure of the fistula in 3 of these cases, and a partial closure, with the restoration of a power of retaining the urine for varying periods, in 4 others. The remaining 2 operations were unsuccessful.

Dr. Hayward is a strenuous opponent of the doctrine that there is anything contagious in the Asiatic cholera, and his paper on that subject will be read with interest still; for although as old as 1832, it is reproduced, and its doctrines are affirmed anew at the date of the publication of the present volume. His arguments are chiefly drawn from the allegation, that the disease did *not* follow the lines of human traffic in its course westward, from the fact of its spontaneous outbreak in ships at sea, and from the immunity from the disease enjoyed by the habitual attendants on the sick. Of the other numerous papers, we need call attention to but one, which contains the statistics of pulmonary consumption in the cities of Boston, New York, and Philadelphia, for forty years (1810—1850), with remarks:

"The most striking fact brought to light by these tables is the great decrease of deaths by consumption in these cities. This decrease has been great in all, and is not only relative but absolute, for the mortality has been somewhat more during the third period of ten years than it was thirty years before. During the first period of ten years, the deaths from consumption were to the total mortality in Boston as 1 in 4·622; while in the fourth decennium, they reached only 1 in 7·011. In like manner, in New York, the improvement was from 1 in 4·467 to 1 in 7·730. In Philadelphia, during the same two periods, the proportionate mortality was 1 in 6·498 against 1 in 8·080. The only exception is, that consumption has somewhat increased in Boston during the last ten years; and that, for this period, this city has been surpassed by Philadelphia in its exemption from that disease." (Hayward, p. 301.)

We look upon the work of Mr. Atlee with much interest, not only as a book full of ingenuities, both in diagnosis and surgical practice, but still more as a specimen of the kind of instruction which awakens the attention of students in the most important department of their duties, clinical study. The indifference which is shown by the great majority of our students to every form of clinical instruction, contrasts strikingly with the attention of the crowds who throng the clinical theatres and wards of the French capital. In none of the hospitals of our metropolis are the medical officers without occasion to regret the ill-success of their schemes to attract students to the wards. Their systematic lectures are regularly, sometimes eagerly, attended; but no amount of professional reputation avails to secure a similar attention to their clinical instructions. Yet clinical teaching is the most valuable of all teaching, and those whose duty it is to undertake it, would find in this volume many valuable hints as to the best mode of pursuing it.

Not only are these lectures evidently the work of a man full of knowledge, and skilful to impart it, but they seem to have been mostly studied beforehand, which our English bedside aphorisms usually are not. It seems also to have been M. Nélaton's invariable practice to announce his opinion or his doubts as to the nature and the prognosis of each case before proceeding to treat it. The students, thus sharing the thoughts and eager to test the judgment of their instructor, follow with watchful zeal the progress of the case, and, whether he were right or wrong, become substantial gainers by every such exercise. In such a case as the following, we have a record which is instructive at once as a surgical fact, as a fact well told (though we have much abridged it), and as a model of ingenious teaching.

"*Veno-arterial Aneurism.*—A woman entered the wards with a very complex affection. Her tongue was large, and deformed by lumps of a bluish colour. Some parts of it were harder than natural; others softer; and in others, again, the consistence was unaltered. At the base, alongside of the papillæ, were large violet-coloured granulations, like mushrooms. There were venous tumours upon the lip and on the inside of the mouth, as well as upon the side of the neck and beneath the jaw. Inside of the mouth, under the tongue, was a projection, bluish, but more pale than would be a simple dilatation of the veins. Under the jaw was another projection, and, by proper pressure, it was found to be the same tumour with that under the tongue. This tumour was supposed to be ranula. Another order of symptoms had caused a belief in the existence of aneurism, and led to the patient being sent to the hospital. In the region of the carotid was a tumour, situated alongside of the larynx, and extending upward as far as the projection caused by the ranula. This tumour, by pressure, was made to disappear with the greatest facility; it pulsated, and presented a *frémissement*, which was very apparent; but in order to appreciate it, the pressure had to be very slight. A peculiar *bruit de souffle* also existed; it was continuous, only at each beat of the heart it was augmented. There was a slight difficulty in eating and speaking, but the condition of the tongue and the tumour in the mouth explained this.

"These things being determined, three diseases could give rise to these symptoms. In the first place, there was a ranula, and, besides that, there were two vascular affections. That in the tongue was a venous erectile tumour, and, as is almost always the case, was congenital. The other affection was either an arterio-venous aneurism, an aneurism by anastomosis, or else what is called an arterial varix. The continuous *bruit de souffle*, which existed in this tumour, is

only found in three conditions—in chlorosis, and in the two affections just mentioned. The sound was limited to the part, and could not arise from chlorosis. If it were an arterial varix, the sound would be extended everywhere throughout the whole region. It is very rare that the affection does not extend itself to all the arteries of a part; but as the sound was limited, and greatest near the thyroid cartilage, M. Nélaton inclined to admit the existence of a communication between the artery and vein, of an arterioso-venous aneurism.

"About two weeks before coming to the hospital, this patient had had an attack which placed her in great danger. An enormous tumefaction on the left side, by which the whole space between the jaw and the shoulder had been filled, had taken place, and the general symptoms accompanying it had been very severe. When she entered, hard lumps were found here and there throughout that region; the lumps were clots of blood resulting from inflammation of the varicose veins, which had given rise to the alarming symptoms that had before existed.

"In the treatment it was determined to interfere only with the ranula; the venous erectile tumour might remain stationary, and give no trouble, and the only operation suited to the arterioso-venous aneurism was that of tying the artery on either side of the opening in it; such a proceeding could not be pursued in this case.

"When the trocar was plunged into the tumour, nothing but venous blood issued. M. Nélaton said he had opened one of the varicose veins before reaching the ranula. The flow of blood was quite abundant, and interfered with the operation, so that M. Nélaton was content with making as much come out as he could, and only using water as a subsequent injection. The patient did very well until the fourth day after the operation, when she had buzzing in the ears, was delirious at night, and had several liquid stools. She did not complain of the region operated on, when it was touched. On the third day of the attack there had been but one stool since the day before, but the condition of the woman was very alarming; her appearance had changed profoundly. On the sixth day she died. At the autopsy, pus was found under the arachnoid, but nowhere else in the body; there were no signs of purulent absorption in any part. M. Nélaton said the patient had died from an attack of meningitis. It should be mentioned that at that time there were many cases of cholera in the hospital. When a canula was introduced into the opening made under the tongue, and air blown into it, the whole submaxillary venous mass was blown up, and the tongue also, so that it was everywhere crepitant. The dissection of what was supposed to be an *arterioso-venous communication, direct, without any false consecutive aneurism*, was performed with the greatest care; an injection was thrown, with gentleness and slowness, into the primitive carotid; and, at the expiration of a few moments, it flowed back from a small venous branch. This, it is true, can always be accomplished, but it requires generally more force than was employed in this instance. It was, however, impossible to find the place where the communication existed. There was no aneurism of the carotid, nor was there a varicose condition of the arteries." (Nélaton, p. 67.)

It will be quite beyond our power to furnish, in our small space, an adequate idea of the practice and opinions of M. Nélaton, or of the impression of candour and ability conveyed to us by Mr. Atlee's mode of detailing them. While there are some modes of treating diseases to which we should take exception, there are others which are models of ingenuity and skill. We should forbear, for instance, from extirpating the mammary gland, even in a male subject, merely on account of neuralgia. (p. 503.) The serious consequences of practising iodine injections into cavities of all kinds, knee-joints included, are described with sufficient frequency in this volume to deter us from following M. Nélaton

in his ill-judged and hazardous use of them. He makes a distinction, too, between anthrax and diffused phlegmon, which appears to us to lead to wrong practice. He says,

"Let an anthrax alone, there will be openings formed, pus and the core (*bourbillon*) will come out, and after that it will heal; but if you make incisions into it, the edges of the incision will separate very widely, and the healing process will be very long. It must not be imagined that the incisions relieve a strangulation." (Nélaton, p. 35.)

When gangrene of the subjacent tissues has taken place, of course he recommends incisions. But for the most part, though we cannot commend all his practice, M. Nélaton's treatment is characterized by great ingenuity, and directed by a very accurate acquaintance with the various features of the case in hand. Here is an example of his ingenuity, though we cannot but think that it was applied to the wrong limb.

"A young man, aged twenty, had had necrosis of one tibia since he had been five years of age, and the diseased bone was two-fifths of an inch longer than its fellow. The deformity had reacted on the whole skeleton; the pelvis was elevated on the side of the longer limb, and the vertebral column, from being thrown to the opposite side, was curved, and its concavity looked towards the side of the longer limb. M. Nélaton stated that he had made use of this fact to remedy incurvations of the vertebral column, advising a thicker sole to be worn on the side of the concavity. At another part of the book he states that he had found the plan successful." (Nélaton, p. 280.)

Surely, if too long a limb produces lateral curvature of the spine, it is to be cured by lengthening the short limb, or that on the side of the convexity. Mr. Atlee relates three cases of extirpation of the whole tongue for extensive cancer of that organ, prefacing their history with the following quotation from M. Nélaton's remarks:

"As regards the condition of the patient after the extirpation of the tongue, as far as speech is concerned, he gets along very well; the tongue is not indispensably necessary for speech; in congenital absence of that organ, for three or four years the child does not speak, but afterwards he acquires the power of doing so very well."

Nevertheless, we can hardly look upon the operation as likely to commend itself to surgeons in this country. The lower jaw is divided in the mesial line, and the tongue excised from the epiglottis forward; the hæmorrhage is great, and often recurs; œdema of the glottis may soon follow the operation, pneumonia and pyæmia at a later period; and of M. Nélaton's three cases, one died of suppuration in the parotid, and another of pneumonia. In the third case "the wound healed, and the patient left the wards well."

The following extract is worth noting, as illustrating the treatment of the very uncontrollable enlargements of the bursa beneath the annular ligament of the wrist:

"The first of these cases got well almost immediately upon the application of *sinapismes volantes*—i.e., a sinapism for a quarter of an hour at a time, and applied six times a day. The second case had been successfully treated six months before, by applications of alcohol; the affection had, however, returned. They were again made use of, and with marked benefit; in two days the pains had disappeared, and the effusion gradually followed. This application of pure alcohol is painful, the epidermis is raised by it, it produces true vesication. In the third

case, in which perforation had taken place, blisters were made use of, but without producing any great amelioration; after them, cauterizations over the course of the tendons were practised, but without any marked benefit. After the patient had been nearly six months in the wards, with some hesitation from doubts as to the innocuity of the proceeding, injections of iodine were made use of, and under their influence the sac rapidly healed, and the fistula closed." (Nélaton, p. 104.)

In his observations on amputations about the foot, we are somewhat surprised to find the very moderate approbation which M. Nélaton affords to the operations of both Chopart and Syme. The latter he calls good, but good when you cannot do better; that is to say, when you cannot leave the leg longer, perform an operation which is less dangerous, and make your patient independent afterwards of a costly instrument. He seems also to have had trouble with the stumps after Chopart's operation, from the turning of the foot by the traction of the muscles of the calf, the pressure exerted upon the cicatrix against the ground, and the formation of corns, which sometimes force the patient to ask for a new amputation. But then, it does not appear that he is in the habit of removing the lower edge of the os calcis, to which the annoyance is chiefly due. We have practised this on all occasions, and have never failed to be satisfied with it; and in a recent case, in which this was done, and a firm case of starched bandage applied round the stump as soon as the wound was healed, the patient bore confidently on the limb, and walked without a stick at the end of two months from the amputation. M. Nélaton's experience is adverse to the practice of dividing the tendo-Achillis in these cases: he has done it four times in one patient in vain; and our own belief is more and more confirmed in its being unnecessary, whenever the foot is from the first, and for a sufficient time, firmly supported by a tightly-fitting case. The following operation is an important addition to those which are commonly practised in this region of the body:

"The operation of amputating the foot below the astragalus was first proposed in 1839, and it has been found to surpass all expectations. It has been performed in Paris at least fifteen times, by Roux, Malgaigne, and many others. It is tedious, as all operations of the same kind are. The following is the method practised by M. Nélaton:—

"The first step is to form the flap in the soft parts, and this plan, about which there have been so many discussions, was invented, M. Nélaton believes, by M. Roux, of Toulon. The surgeon commences the incision six-fifths of an inch from the point of the heel, on a line drawn from it to the external malleolus, and carries it along to the external edge of the foot, behind the projection formed by the posterior extremity of the fifth metatarsal bone; then obliquely across the sole of the foot and passing over the projection of the scaphoid bone, and over the dorsal surface, an inch and three-fifths in front of the angle it forms with the leg, it is brought round to the point of commencement. This incision encloses a flap of soft parts, by which the bones are covered, to use M. Nélaton's expression, *to perfect perfection*.

"The second step of the operation is to make a movement by which the anterior extremity of the foot is forced in the direction of its internal and plantar surfaces, so as to make the head of the astragalus project; and when this has been done, nothing is more easy than to divide the ligaments by which the bones are held together.

"But now, in order that the operation may be well done, all the soft parts enclosed by the incision made in the first step of the operation, must be preserved, and the bloodvessels must be respected as they pass along the internal side of the

articulation. For this purpose the surgeon must extract the calcaneum *by resecting it*, and this is very laborious; the tendo-Achillis and all the parts must be separated as near as possible to the bone. The surgeon must never expect to do this operation as he does that of Chopart.

"The same flap, made a little smaller, would answer in amputating at the ankle-joint, in case the astragalus should not be found entirely healthy; in which case, also, the malleoli should be removed. These two operations, above and below the astragalus, differ in this, in the length of the limb left afterwards, a difference amounting to one inch." (Nélaton, p. 219—223.)

A stump made in this manner is described as healed in six weeks, round, and well formed; and when pressure was made against it, there was no pain. The shortening was four-fifths of an inch. The under surface of the astragalus is not regular, but by degrees it becomes so, and the projections, from which bad effects might be feared, then disappear.

Of another case it is said: the cicatrization of the wound was quite tedious; it was not completed before the expiration of three months. It was delayed by the formation of two abscesses; one anteriorly, from inflammation in the sheath of the tibialis anticus; the other at the heel. The result was as satisfactory as possible; the limb had lost but four-fifths of an inch in length, and the stump itself was perfect. The patient was able to walk about the hospital very well. In twenty months he returned, walking still very well, and having on one occasion walked a distance of twelve miles, and returned the same day.

It should be stated that one of these patients was twenty years of age, and the other but sixteen. It is not improbable that, in amputations of this kind done at a later period of life, the stump would accommodate itself less readily to the inequalities of the lower surface of the astragalus, and that it might be wise to remove the angles of its posterior and concave articulating surface.

Fibrous Polypus of the Nose.—The following plan of operating commends itself as applicable in some cases to which the present modes of extirpating certain polypi are not suited:

"Some time ago, toward the close of the year 1848, a young man went to M. Marotte, complaining only of epistaxis; M. Marotte thought that there was a polypus of the nose. At a later period, on the patient applying to M. Nélaton, he found the soft palate projected forward, and other signs of a fibrous polypus of the base of the skull, and he ascertained it to be implanted at the basilar process, near the petrous portion of the temporal bone, at the sphenoid, and continuing forward, at almost the whole internal face of the pterygoid process. M. Flobert had already practised an operation that threw some light on the subject; he took away the superior maxillary bone, and was thus enabled to remove the whole polypus and a great part of its roots. He was so happy as to cure his patient. Soon afterwards a surgeon of Lyons did the same, but the details of the case were not published. M. Nélaton was acquainted with these facts, but he was not decided to practise the removal of the maxilla; he thought it better to excise the roof of the mouth, a very simple operation. M. Manne, of Avignon, was the first to have the idea of dividing the velum palati in order to get at these polypi. M. Nélaton was aware of this plan, and determined to go still further. He cut the membrane, hard as leather, covering the roof of the mouth, firmly down to the bone, in the median line; an incision was then made anteriorly from one side of the mouth to the other, meeting the other, so as to form a T-shaped incision; with a spatula the membrane was then detached from the bone on each side; this detachment is easily performed. There are some difficulties, however, in turning the membrane

aside posteriorly, and this is the cause of it: the velum palati is formed of two membranes, one palatine, the other nasal; it is then easy to understand that when you try to drag it aside, no matter how thoroughly it has been detached in the mouth, it still adheres by the posterior layer. This posterior layer of the velum must be cut by a pair of curved scissors. The soft parts being thus turned to the sides, with a small perforator, two holes were made in front, one on the right, the other on the left; a blade of Liston's forceps was then inserted into each hole, and the bone was cut. The bony roof of the mouth was broken to pieces, and thus a large opening was made by which to extract the polypus, the whole of which was then excised; the operation, however, was by no means considered as completed.

"The next day, the whole of the wound was found united from top to bottom; the parts were separated again; the following day they had again reunited, and were again separated; they remained afterwards without uniting. The patient had an attack of pericarditis, which prevented a continuation of the treatment for some time, but when he recovered, the roots of the tumour were scraped away, and Vienna paste applied. All this, as may readily be believed, was not the affair of a week's time, but of two or three months. When all was thought to be destroyed, the patient was still kept several months longer in the wards, and at the expiration of that time, there being no symptom of a return of the affection, staphyloraphy was performed, and the palate reunited. M. Nélaton saw this patient again in 1853; the opening in the roof of the mouth had a diameter of about one line laterally, and three lines antero-posteriorly." (Nélaton, p. 421.)

The propriety of such an operation is found in the fact that by no other means can tumours of this description be entirely removed. They may appear, from the extent to which they have raised the mucous membrane of the pharynx, to originate from the bodies of the upper cervical vertebræ, and they have been supposed to spring as low down as the fourth cervical; but that vertebra is, in fact, opposite the larynx, and the velum palati is in relation with the body of the axis; there is, therefore, less room in the vertebral column than has been imagined for the attachment of the root of a tumour. These fibrous polypi mostly grow from the basilar process of the base of the skull, a little behind the point at which malignant growths usually make their first appearance in this locality. The root of a tumour in such a situation can of course not be reached so as to be extirpated either by ligature, by removing the superior maxillary bone, or dividing the soft palate; for though its various projections may be found in the nostrils, the antrum, the zygomatic fossa, the pharynx, or even—by its pressure causing absorption of the palate—in the mouth, yet its roots are closely mingled with the periosteum of the basilar process, and can only be securely eradicated by direct applications to that part. When the superior maxillary bone is removed, there is but little space at the back of the nostrils to work in; and as the wound is closed at once, there remains no opportunity to repeat applications to the original site of the growth, from which it may be expected to spring forth again. The operation through the palate has at least the advantage in this latter respect of leaving an opening, though it may be doubted whether another allegation in its favour will be found generally true—viz., that when the periosteum below, and the Schneiderian membrane above, are left, these two membranes being placed in contact, the bone is regenerated. The after-treatment of a second case is thus described:—

"During eighteen days, rugination was practised, by means of various instruments, upon the remainder of the polypus, the surface of which was more than two

inches in length, and nearly an inch and a half in breadth. At the expiration of that time, cauterization, by means of the electrical apparatus, was had recourse to. Ten days afterwards, it was cauterized by means of mono-hydrous nitric acid; the small platina wire of the electric cautery not destroying fast enough. The acid was used for a long time; at each application being left in contact with the part, four, five, or six minutes. On account of the stifling vapours of this acid, so irritating to the air-passages, the cotton dipped in it was pushed through glass tubes, whose section was more or less oblique, according to the surfaces against which it was to be applied. One inconvenience must also be attended to in this operation, that the ball of cotton does not fill the tube; for if it does, the vapour cannot escape at the sides as you push it with the glass rod, and it is driven into the throat. These applications demanded the greatest patience, both of the surgeon and of the patient; they were constantly made use of for four or five months, when but a small portion, about the size of the end of the thumb, was left. As this nipple-shaped lump was being destroyed, the projection of the eye was much diminished. M. Nélaton thought it to be a prolongation of the polypus into the zygomatic fossa, through the hole of the ganglion of Meckel—a part at which its adhesions were only membranous, not periosteal. In the course of another month, the patient left the ward, cured of his polypus." (Nélaton, p. 424.)

From the description of a third case, which terminated fatally, we should be disposed to think that the disease was, in that instance, of cancerous nature. A prolongation of the tumour entered the cranium, and compressed the optic nerve. The patient had complained of sharp pain in the head, while his right pupil was much larger than the left, and immovable.

Lithotomy through the Rectum.—From some interesting cases of lithotomy we abridge the following:

A man, fourteen years before admission, had passed yellowish urine, mixed each time with a teaspoonful of sand. Within the last eight months, he had stopped passing the sand, and begun to pass blood, to micturate every quarter of an hour, and to become weaker and thinner. No stricture of the urethra was detected with the sound, yet the whole of the membranous and spongy portions were felt to be more narrow than usual. At the prostatic portion, every time the sound was pushed so far, a foreign body was detected; there were evidently one or more calculi there. Whenever the urethra was touched from the rectum, a peculiar sensation, one arising from the rubbing together of many fragments, was distinctly experienced. When the finger was so placed as to touch the anterior extremity of the prostate, and a sound was passed into the urethra as far as the point of the finger, a very slight push at once brought the instrument in contact with a stone. There were calculi, then, in the prostate. The wall between the rectum and urethra was so thin, that it seemed to indicate a dilatation of these parts; and when a straight sound, with a small portion of its extremity, bent at a right angle, was passed as far as the prostate, a movement of rotation was easily made, and the dilatation of that portion of the urethra into a true *prostatic pocket* was ascertained. Moreover, there was a large calculus in the bladder. M. Nélaton believed the small stones in the pocket of the prostate to be fragments which had been deposited there after the *spontaneous fragmentation of the large calculus in the bladder*. The patient had in his possession a small fragment, evidently a shell from a large mass. M. Nélaton said, that calculi in the bladder seem sometimes to be broken up by an *interior* force.

"Lithotrity was rejected in this case, on account of the narrowing of the urethra in front of the dilated prostate, and the diseased condition of the bladder; but the following operation was performed. The thumbs were inserted into the anus, and dragged asunder until they touched the tuberosities of the ischium, and an interior rupture was felt. After this proceeding (which is that recommended by M. Réca-

mier, and adopted by M. Nélaton, for the cure of fissure of the anus), the anterior part of the rectum can usually be seen, as well as the perinæum. However, the struggles of the patient under the influence of the chloroform, occasioned a prolapsus of the rectum through the now useless sphincter ani; and M. Nélaton proceeded by feeling, instead of by sight. With one stroke of the bistoury, he cut down upon the sound through the rectum and urethra; he then enlarged the opening by several strokes of the knife, and then gliding the lithotome through the opening into the bladder, he opened and withdrew it, cutting the lateral parts of the prostate. He found at once the calculus, which was at least two and a half inches in diameter. After it had been extracted, by introducing his finger into the prostatic pocket, he found numerous calculi, or rather fragments of another calculus. M. Leroy d'Etiolles, who was present at the operation, was afraid that all the fragments were not extracted, for, on putting them together, *a whole* was not formed; but M. Nélaton did not participate in his fears, as he thought these fragments had, at one time or other, been detached from the large calculus, upon which again deposits had been formed. At all events, it was impossible to find any more pieces.

"For three or four days the patient went on well; on the evening of the fifth day, he had some inclination to vomit, and tenderness above the pubes. On the seventh day pain came on in the left renal region; then appeared dyspnœa, smallness of the pulse, and cold extremities, and also what the French call *la voix cassée*, the worst sign in all such abdominal cases, as, for instance, strangulated hernia. Opium was the chief treatment, but the patient died. There is no record of the examination of the body." (Nélaton, p. 673.)

The Actual Cautery.—We had expected to find a much more extended account of the value and proper application of this remedy than is contained in Mr. Atlee's work. The cautery is evidently in frequent use in M. Nélaton's wards; and from one passage in this book it is clear that the Professor thinks highly of it. He is reported to use it most frequently in chronic affections of joints, and by repeated applications of it to succeed in their cure. Although the employment of anæsthetic agents enables surgeons now-a-days to apply the cautery both readily and freely, it does not appear to us that we are left to this unpleasant resource in the treatment of chronic diseases of joints, and we are not aware of the adoption of that practice by any English surgeons. But the case is far different with certain acute diseases of the articulations. There is a class or a stage of these diseases, in which joints undergo a very rapid destruction, and in which the characters of severe pain, tenderness, and immobility of the joint, with agonising startings of the limb during sleep, denote the existence of an inflammatory ulceration of the cartilages and of the thin layer of compact articular bone beneath them. Such symptoms occasionally yield to the treatment ordinarily recommended in systematic works, but they yield slowly, and too often, in spite of treatment, they are followed by suppuration and the destruction of the joint. Now it is in these cases that the power of the actual cautery is most strikingly shown. A pale, emaciated boy came under our care at the Middlesex Hospital. He was nine years of age, and had the fretful anxious look and the petulant temper of one who had been reduced and deprived of his rest by acute suffering. All his attention was fixed upon his left knee, which was bent, shining and tender, a little swollen above the patella, and capable of a very slight amount of flexion and extension. The most trifling motion, however, caused pain, which, when the limb started, as it did during his sleep, was very severe. Only four

weeks before his admission, he had been stout and healthy; then he began to limp, and then to suffer pain. After that, severe sympathetic fever came on, and the symptoms with which he was afterwards admitted.

Mercurial and camphor ointment was freely applied, beneath a poultice, to the knee, and he took a sedative draught at night.

On the fourth day there was no relief to the pain, and the knee contained more fluid. His look was still fretful. Chloroform was given him, and the actual cautery freely applied to a large extent of the surface over and about the knee. The limb was wrapped in cotton wool. The sedative draught was continued. The pain was at once relieved, and the boy's tone and appearance speedily improved. In a fortnight, the skin of the knee had entirely recovered from the effects of the cautery, but the fluid in the joint had not diminished, and a little tenderness still remained. A couple of blisters were put on, and when the second had healed, the articulation was of natural size, free from pain and tenderness, and capable of motion. After this, he began to walk about, and was discharged quite well.

A remedy so potent in controlling violent local disease, finds its use under other circumstances also; and we have employed it with satisfaction when under the necessity of making incisions into large articulations, which retained their natural structures. Incisions into joints full of pus, of course afford more relief than injury, whilst natural joints mostly resent incisions by a severe inflammation. Our experience of its effect under such circumstances would lead us to employ it also in the accidental injuries, in which large joints are opened by incision, and to expect that more cases might terminate favourably than now escape the issue in anchylosis, amputation, or death.

The point of greatest importance in the selection of cases for treatment by the cautery is, that suppuration should not be established in or about the joint. When an abscess has formed, the cautery will relieve the pain, but not arrest the disease, and the surgeon will be disappointed in its use. There are, however, cases in which it is impossible to determine whether the disease of the joint has reached the stage of suppuration; the cautery may be used under those circumstances, and may sometimes prove efficacious in stopping suppuration, even when it has actually begun. A strumous lad, aged fourteen, was under our care in the Middlesex Hospital, for necrosis of the femur. He continued tolerably well, until pains came on in his shoulders, and in a few days his right shoulder was considerably swollen by an effusion of fluid underneath the deltoid muscle. The swelling subsided after the application of a large blister to the surface. In a few days more, pain came on about the thigh and fistulous orifice, an ill-developed erysipelatous redness appeared about the fistula, and he became very low. This was followed by pain down the fibula, proceeding from a swollen part on the outer side of the ham, and on pressing that part, some pus, mixed with large yellow globules like synovial fluid, escaped through the sinus. The pain increased in the night, and the next morning the knee-joint was tensely full of fluid, and extremely tender and painful. During the following three days it became larger and yet more tense, and the pain was not relieved. By a long subcutaneous puncture with a trocar and canula, we let out

from the joint four or five ounces of opaque, turbid, light greenish-brown, serous fluid, mixed with many whitish flocculi of puriform character, and some gelatinous lymph. Examined beneath the microscope, the fluid was found to contain a good deal of pus, though the appearance presented to the naked eye did not certainly indicate it. In two days the joint was full of fluid again. An attack of erysipelas came on in the thigh, during which the fluid was in part absorbed from the joint. In three days more, severe pain had begun again, and his state required the adoption of some decided treatment in order to save the limb. The actual cautery was applied, and an opiate given. The effect was immediate. He awoke cheerful, and the pain never returned. Free discharge took place from the charred surfaces, and he had a renewed attack of erysipelas of the thigh. The swelling of the knee subsided, the joint recovered, and the following year he was in excellent health, stout, ruddy, grown, and with his knee well, but there was no change in the state of the femur and sinus.

Review III.

Hospitals-Meddelelser. Anden Række. Udgivet af C. E. Fenger, Dr. med. Professor ved Universitetet, Overlæge ved det kgl. Frederiks Hospital. Første Bind.—*Kjøbenhavn*, 1856.

Hospital Communications. Second Series. Edited by C. E. Fenger, M.D., Professor to the University, Principal Physician to Frederik's Royal Hospital. First volume.—*Copenhagen.* 8vo, pp. 576.

Under the modest title of 'Hospital Communications,' we are presented, in the volume before us, with a series of valuable essays upon some of the most important and interesting subjects which just now engage the attention of the practical physician. A brief analysis of the work will not, we trust, prove unacceptable to our readers, and it will, we think, show, that although the labours of our Danish brethren have hitherto been less known to us than those of our colleagues in many other states of continental Europe, they are not less worthy of our consideration.

In the preface we are informed that the first series of the journal, the numbers of which were issued bi-monthly, was discontinued at the end of the year 1853. The plan of publication is now changed; the present cannot in fact, strictly speaking, be called a periodical, as it does not appear at any stated interval, but is issued only when the editor finds himself in possession of sufficient material to fill a volume. It is argued that this system is better suited to the circumstances of Denmark, where the labourers in the field of medical science are not very numerous, than the plan which compels the editor to have a certain number of sheets ready on a given day; and that it admits of the introduction of longer essays without the necessity of interrupting them once or oftener, and obliging the reader to wait several months for their continuation.

I. The first paper in the present collection is by Dr. E. Fenger, and is on the subject of "echoes" in the human thorax. We may state the case in the words of the author himself, who, after some preliminary observations, remarks that—

"Every one who has paid any attention to auscultation knows, that when at one side of the chest one of the pathological conditions has occurred, by which a strongly bronchial character of the respiratory and vocal sounds is produced, and when this morbid change is situated in the most interior portion of the posterior surface of the chest, close to the vertebral column, these sounds are heard not only at the innermost part of the ribs, but also on the vertebral column, and not only at the affected side of the latter, but also at the sound side. This is simply a phenomenon of the conducting of sound, which admits of a ready explanation; for the diseased part lies in immediate contact with the dorsal vertebræ, consequently the latter must, as good conductors, be able with ease to convey the abnormal sounds to the surface; and as they are situated in the middle line of the body, and do not consist of two distinct lateral portions, but form a connected whole, there is no reason why they should propagate the sound less to one side of their surface than to the other, or why the abnormal sounds should be less distinctly heard at the healthy side of the spinous processes than at the other.

"But in a portion of these cases we will find, that on removing the ear farther out on the healthy side of the chest, a bronchial character of respiration and of the voice is still audible at a certain distance from the vertebral column; we will further find that these phenomena, after having disappeared at a short distance from the spine, again occur or are increased at a greater distance from the same—for example, at the inner edge of the scapula; indeed in some cases we may even observe that they continue much further outwards towards the axilla and the side of the chest." (p. 5.)

It is particularly when the affected parts are situated near from the third to the fifth dorsal vertebræ, and consequently comprise the inner part of the posterior surface of the lung, especially the lower portion of the upper lobe or the upper portion of the lower lobe, that these phenomena are perceived, and they consist in this:

"That bronchial respiration and bronchophony are heard on the healthy side of the chest, where neither percussion nor the symptoms indicate the existence of any abnormity. The bronchial respiration is heard in most cases only as a prolonged and blowing expiratory sound, or as a short though very brisk puff at every expiration; but at other times a very distinct bronchial inspiratory sound is also heard, either with or without superadded vesicular inspiration. The sound of expiration alone is changed in the cases in which the phenomenon is weak; the inspiratory also is modified when it is strong." (p. 9.)

In pleuritis, ægophony is, in like manner, heard on the healthy side.

"The sounds are heard, as already remarked, in the vertebral column, and in the space between this and the scapula. When the phenomenon is well marked, the echo will be heard in the entire of this region, or in the greatest part of its extent from above downwards. But when it occurs in a slighter degree it will be observed that it is not equally distributed over this space, and it will often be found that if the ear be carried from the point of the vertebral column where the sound is strongest, in a horizontal direction outwards towards the scapula, the sound disappears, either partially or completely at a short distance from the spine, to become again more audible towards the angle of the ribs, or close to the superior or inferior angle of the inner edge of the scapula. If we now examine more accurately, we shall find that the sounds in such cases seem to follow linear paths, which proceed from a point near the third or fourth dorsal vertebra, and thence diverge towards the inner edge of the scapula, the most superior path running out towards the upper angle of this bone, and the most inferior towards the lower; and that between these there are one, two, or at most three similar paths extending with less deviation from the horizontal direction between the point just mentioned and the scapula; the weaker the phenomenon is, the narrower are these paths; if it becomes stronger they spread and coalesce. Most frequently they disappear at

the inner edge of the scapula; but it is not unusual to find them passing over this, so that they can be heard at the inner part of the bone itself, both above and below its spine, and at its inferior angle; indeed, in some cases I have been able to follow it still further, and then chiefly in two directions—either down over the inferior angle of the scapula and round to the side of the chest towards the inferior edge of the lung, or horizontally along the spine of the scapula to the acromion process, and thence into the axilla." (p. 10.)

The author next proceeds, by the recital of a number of cases, to remove any doubt as to the existence of these echoes which might arise from the suspicion that the sounds in question might have been due to incipient pneumonia or pleuritis in the so-called healthy side. That this was not the case he shows from the clearness of the sound elicited on percussion, the absence of crepitus, and the fact that the echoes occur too frequently to allow of their being with any probability attributed to double pneumonia or pleuritis, which are rare diseases; but lastly, the decisive proof is furnished by the fatal cases and the results of post-mortem examination.

With regard to some of the other physical signs derived from auscultation, the author has never succeeded in hearing the pleuritic friction-sound propagated to the other side of the chest; the finer râles, especially the crepitating, are usually heard only on the side on which they are developed. The author quotes a case to prove that it can in some instances be demonstrated that sounds formed in cavities may give an echo on the opposite side, and from his observations draws the practical inference that the greatest caution is necessary in the diagnosis of double pneumonia or pleuritis, as well as, under certain circumstances, of cavities in both sides of the chest, especially when they manifest themselves posteriorly. In some cases, too, we shall be able, with the aid of the echo, to diagnose a central pneumonia, or a pneumonia which has not yet approached the surface of the lungs, before it can be recognised by means of the characteristic phenomena on the affected side; but the author considers that the greatest importance of the echoes, at least just now, is in a theoretic point of view, especially with reference to the explanation of the bronchial character of the respiration and voice in pneumonia and pleuritis.

Having passed in review the theories by which Laennec and Skoda have sought to account for the production of these phenomena, as well as the objections brought forward against the views of the latter distinguished observer by Dr. Walshe, Dr. Hoppe of Berlin, and Professor Wintrich of Erlangen, the author proceeds to observe, that in the present position of the argument there are three among the questions which have been proposed, the solution of which is of especial importance, namely—

Is the hepatized pulmonary tissue a better conductor of sound than the healthy?

Can the sound formed in the rima glottidis be, under certain circumstances, magnified in the bronchi? and, if this be answered in the affirmative,

Is this strengthening of the sound to be attributed to the occurrence of consonance?

He considers that the first question can as yet scarcely be looked upon as having been satisfactorily answered, and in a note he informs us that

he has himself commenced a series of experiments which he hopes may prove decisive of the point. He is of opinion that in inflammation of the chest the respiratory murmur and the voice are modified and magnified in the bronchi, and that the theory of Laennec, who referred the phenomena of bronchophony and bronchial respiration mainly to improved conduction of the sounds from the bronchi to the surface of the chest, is incorrect. He thinks the least improbable of the explanations which have been advanced, to be that which attributes these phenomena to the reflexion of the acoustic waves from the bronchial walls in the hepatized or compressed pulmonary tissue, and their concentration in the cavity of the tubes; but adds that much remains to be done before this theory can be looked upon as either established or refuted.

In concluding the foregoing very brief abstract of Professor Fenger's valuable paper, we would merely remark that the question will still naturally suggest itself, whether the phenomena described by him may not be the results of a simple conduction of sound, and whether the term "echo" in such a case should not be looked upon as merely expressing the existing state of things, and not as representing a theory by which it may be accounted for? The disappearance of the sound in some places, and its reappearance at a greater distance, would not disprove its conduction, as it might follow the course of denser tissues, which may be much more deeply seated in some parts than in others. If, however, we have succeeded in furnishing our readers with a sufficiently clear view of the author's statements, their practical importance will be obvious; the subject is one which calls for accurate investigation at the bedside; we therefore leave it for the present, and pass to the Essay of F. Howitz, candidate of Frederik's Hospital, On the Behaviour of the Combinations of Chlorine, and especially of Common Salt, in the Urine, under several Pathological Conditions.

II. Herre Howitz has himself made upwards of 600 quantitative analyses of the urine, and he prefaces his paper with a full description of his mode of proceeding; we shall, however, be able to occupy ourselves only with his results. He takes as his starting-point the conditions laid down by A. Hegar, in a treatise published at Giessen, in 1852, as influencing the excretion of chlorides in the urine in healthy individuals: these are, the amount of common salt contained in the food; the mode of life and constitution of the individual; the period of the day, the elimination of chlorides being greatest in the afternoon and least at night; towards morning it again increases, even though no chloride should have been ingested. Exercise favours their excretion, as do copious draughts of water; but after their quantity is increased by the free ingestion of fluid, it again sinks considerably. Something similar takes place during strict abstinence from food, the elimination of the chlorides gradually diminishing; and if much common salt be given after fasting, it increases but slowly, showing that much of the salt has gone to replace what the blood and tissues had lost during abstinence. In the normal state, the excretion of chloride of sodium never entirely ceases; if none be ingested, it is eliminated at the expense of the blood and tissues. If a considerable quantity of common salt be taken, the excretion is immediately largely increased, about in proportion to the ingestion, but it quickly sinks again nearly to

the ordinary amount; an excess of the chloride of sodium must consequently remain in the system, which manifests itself by the peculiar symptoms characteristic of the free use of the salt, as a feeling of fulness, distension of the abdomen, &c.

As a preliminary to his investigations, the author ascertained the amount of salt contained in some of the articles of diet used by the individuals submitted to experiment. Into this part of the subject, however, we need not enter, but it may interest some of our readers to be made acquainted with the nature of the fever dietary of the Danish Hospital. There are two fever diets—the half and the full; the former consists of a "portion" of oatmeal gruel, two spiced biscuits, and one *pægel* (rather more than half a pint) of milk; the full fever diet consists of two small French rolls, half an ounce of butter, a portion of oatmeal gruel, a portion of fish, and one *pægel* of milk.

The amount of chloride of sodium eliminated through the urine depending, in health, in the absence of any peculiar circumstances, on the quantity ingested in or with the food, and being usually about equal to it, the author divides diseases, in reference to the subject of his paper, into three principal classes—namely: 1. Those in which, in a certain time (twenty-four hours), about the same quantity of common salt is excreted with the urine as is, during the same period, ingested with the food, and where the elimination proceeds, in other respects also, as in the healthy individual. 2. Those in which the elimination exceeds the ingestion, none of the causes capable of producing in health a similar disproportion being present. 3. Those in which the amount excreted is less than what is taken in as food.

Among the diseases the author found to be referable to the first class were—typhoid fever, simple bronchitis, capillary bronchitis, gangrene of the lungs, polydipsia, chlorosis, measles, organic diseases of the heart, and several chronic diseases in which nutrition must be looked upon as being considerably affected—as, for example, cancer of the uterus, &c. Ague, hæmorrhage of the brain, traumatic meningitis, tumours in the brain, affections of the spinal marrow (softening), and epileptic fits, were also found to belong to this class. In two cases of rheumatic tetanus, the excretion of chlorides was considerably diminished, but scarcely more so than should have been expected from the small quantity of food the patients could take. During the use of calomel in one of these patients, the elimination rapidly and considerably increased, but sank again immediately after its use was discontinued. The proportion of chlorides was likewise normal in affections of particular nerves—for example, in what appeared to be a rheumatic affection of the seventh pair of cerebral nerves.

In rheumatic fever, the author expected to find a special ratio between the excretion of chloride of sodium and the serous exudations and infiltrations, but this did not appear to exist. When, in the course of this disease, serous effusions took place suddenly, either into the serous cavities or into the areolar tissue, the elimination of common salt usually sank considerably; but this did not occur rapidly, but gradually, and in proportion to the want of appetite. Neither did he observe any sudden great increase of the quantity eliminated to attend the disappearance of these effusions during convalescence.

A. Vogel found the chloride to be proportionate to that contained in the food also in Bright's disease, in calculous affections of both kidneys, and in carcinoma of the liver.

The second class comprises those cases where the elimination of chloride of sodium through the kidneys exceeds the amount of the salt ingested, and is limited to cases of the rapid absorption of serous effusions. A. Vogel had laid down the rule, that, under these circumstances, the quantity of common salt eliminated was augmented in proportion to the increase in the amount of urine excreted. The author reports, from his own observation, the case of a country girl, aged nineteen, of good constitution, in whom extensive serous effusions into the peritoneum and left pleura were rapidly absorbed. The amount of chloride excreted was increased in two days from 6720 to 23,000 milligrammes; nor was the increase merely in proportion to the augmented flow of urine, as stated by Vogel; for on the 11th October, thirteen cubic centimètres of urine contained but five milligrammes of common salt, whereas, on the 18th, the same quantity contained 300 milligrammes. The author remarks that, during the existence of a serous effusion, we may perhaps find in every increase of chloride of sodium in the urine, when this is both relative and absolute, a sign of a rapid absorption of the effusion, and that, *cæteris paribus*, we may, from the more or less abundant elimination of the salt, infer the rate of the absorption. It is evident that a case of pleuritis will, during the rapid absorption of effusion, belong to this class, while during the formation of the effusion, it should be referred to the following.

The third class, as already stated, includes those affections in which the quantity of chlorides eliminated by the kidneys is less than the amount taken into the system by the mouth. The first disease we meet with under this head is pneumonia. The author has quantitatively analysed the urine, by Liebig's method, in a considerable number of cases of various species of pneumonia, and of these investigations he details eight carefully-reported examples. The following are the conclusions he feels himself justified in deducing; they differ in some respects from those arrived at by Dr. Lionel Beale and A. Vogel, who believe that in pneumonia the elimination of chloride of sodium through the kidneys may even altogether cease.

"(*a*.) In individuals labouring under pneumonia, the normal ratio between the amount of chloride of sodium eliminated in the urine, and that brought into the system with the food, is altered; a less quantity being excreted in a given time than is ingested during the same period.

"(*b*.) The elimination of common salt never entirely ceases.

"(*c*.) The diminution in the excretion does not proceed *pari passu* with the hepatization.

"(*d*.) It manifests itself at all ages and in both sexes.

"(*e*.) It takes place whether the patient suffers from the so-called croupy pneumonia, or from lobular, traumatic, or hypostatic pneumonia.

"(*f*.) It occurs without reference to treatment by venesection.

"(*g*.) During pneumonia the administration of large doses of chloride of sodium does not exercise its usual influence on the excretion, as its elimination is not increased nor altered until resolution of the pneumonia sets in.

"(*h*.) The special cause of the remarkable change in the amount of chloride of sodium eliminated in this disease is to be sought in the pneumonia itself, in the circumstance that the pulmonary tissue is attacked in a peculiar manner, and that the respiratory conditions are altered." (p. 118.)

The blood of individuals suffering from pneumonia is found to be unusually deficient in chlorides, consequently it cannot be assumed that a greater quantity than ordinary of chloride of sodium is retained in that fluid; nay, on the contrary, it is evident that the latter must have parted with some of its common salt. A circumstance which demands attention is, that the expectoration in pneumonia is found to be much richer in chlorides than that in other diseases.* Putting all these particulars together, we are led to infer that a special consumption of common salt and of chlorides takes place in pneumonia, and that it is probably in the peculiar exudations in the pulmonary tissue, that this consumption occurs, but how or why it happens is still completely a riddle.

The author reports three cases of acute pleuritis in which, during part of the time when effusion was taking place, the elimination was much diminished; contemporaneously with the absorption of the fluid it was largely increased.

In two cases of violent flying rheumatic pains, the result of the exposure of healthy individuals to draughts of cold air, the elimination was greatly diminished during the pain, but rose remarkably on its cessation.

In a patient labouring under erratic erysipelas, a remarkable and sudden diminution took place, and continued for about a week, when the elimination suddenly rose without any alteration in the diet sufficient to account for the change.

III. Herre Howitz's paper is followed by one by H. Krabbe, likewise candidate of Frederik's Hospital, On Some Cases of Hydatids in the Human Subject. Five are reported—three of cysticerci, all in the brain and its membranes, and two of echinococci, in one case located in a cavity of the right lung, in the other in an abscess as large as a duck's egg, situated at the left side of the spine, at about the fifth dorsal vertebra, between the bodies of the vertebræ and the ribs, under the ligamentary apparatus. The author observes that the occurrence of echinococci in the lung is not so very rare, while it is certainly more uncommon to meet them in the spine.

IV. The next is an elaborate paper by E. Silfverberg, Physician Extraordinary (*Reservelæge*) to Frederik's Hospital, on the subject of Gangrene of the Lung, which disease the author divides into the idiopathic or primitive, and the consecutive; the latter may be the result of, 1st, acute or chronic inflammation of the lung; 2nd, of pulmonary tuberculosis; 3rd, of apoplectic foci in the lung; 4th, of acute or chronic dilatation of the bronchial tubes.

The author furnishes us with some interesting statistics of the disease, based entirely upon cases observed in Frederik's Hospital. Thus he found that the gangrene occurred:

Idiopathically in	28	cases.
After acute inflammation of the lung in	3	„
After chronic inflammation of the lung in	2	„
After acute dilatation of the bronchial tubes in	2	„
After chronic dilatation of the bronchial tubes in	3	„
Total	38	cases.

* Beale, Vogel.

He also examined forty-five cases in reference to the seat of the disease, and found that it occupied

The right lung in		22 cases.
And of it the upper lobe was engaged	9 times.	
The middle lobe was engaged	twice.	
And the lower lobe	11 times.	
The disease was situated in the left lung in		14 cases.
The upper lung being engaged in	3 cases.	
And the lower in	11 „	
It occupied several lobes of the same lung in		6 cases.
And both lungs in		3 „
Total		45 cases.

"The disease has consequently exhibited itself more frequently in the right lung than in the left, and in the lower than in the upper lobe of the left; while on the right side it has occurred with about equal frequency in the upper and lowest lobe; the above result does not, however, agree with what is usually stated. It will be seen that it is not very unusual to find several lobes simultaneously affected, while, on the contrary, it is comparatively rare to find gangrene in both lungs." (p. 202.)

As to the etiology of the disease, it occurred among forty-five cases, thirty-three times in men, and twelve times in women—that is, in the proportion of eleven to four, exactly as stated by Laennec. It might be hence inferred that it is especially likely to be met with in those who are dependent on casual labour for their support, and who are consequently much exposed to vicissitudes of temperature; but it must be borne in mind that this class is, more than any other, addicted to the abuse of spirituous liquors, a vice which seems particularly to favour the development of the disease. Of the forty-five patients, no fewer than sixteen were labourers, and three followed professions which compelled them to take exercise in the open air. Besides the abuse of spirits, ordinary catarrhs, and, in a less degree, the puerperal state, appear to be predisposing causes, and the disease also occurs not very rarely in combination with serious chronic abdominal affections.

Gangrene was met with in drunkards in	8 cases.
„ „ in puerperal women	2 „
„ „ in patients with chronic abdominal disease in	3 „
„ „ in patients subject to bronchitis in	5 „

As to age, it was found to occur,

At 15	once.
At 17	once.
Between 20 and 30	12 times.
„ 30 and 40	7 „
„ 40 and 50	12 „
„ 50 and 60	8 „
„ 60 and 68	4 „

"It is usually stated," observes the author, "that age does not seem to have any essential influence as a predisposing cause of gangrene of the lung; but, on

the one hand, the disease is said not to be uncommon in children after exanthematous fevers; and on the other, it would at least appear from the foregoing table, that persons are more liable to it after than before the age of twenty years; on the whole, it might perhaps be assumed that the disease is rarest between the tenth and twentieth years of life." (p. 205.)

Under the head of symptomatology and diagnosis, the author remarks, that pulmonary gangrene may begin with the signs of an affection presenting little danger; it is only in a few cases that its true nature can be recognised immediately after its commencement; it usually exhibits itself in other and different modes, which may be referred to the following forms of disease:—A. Pneumonia; B. Pleuritis; C. Hæmoptysis; D. Pulmonary catarrh.

A. From his observations on the first variety, the author deduces the maxim, that

"When gangrene, proved by dissection to be such, began during life with all the characteristic signs of inflammation of the lung, it has been consecutive to the latter disease; while, on the contrary, in the idiopathic gangrene occurring with the signs of pneumonia, it will be found that one or other of the most important symptoms of the latter disease was wanting." (p. 219.)

B. Of the 45 cases at Frederik's Hospital, the gangrene began in 5 with signs of pleuritis; in reference to such cases, the author infers that

"Gangrene of the lung may begin with precisely the same symptoms as pleuritis, and in such cases cannot be distinguished from the latter disease until its characteristic symptoms have set in." (p. 223.)

C. But one case was met with of gangrene of the lung with symptoms of hæmoptysis, and therefore the author draws no special conclusion with respect to this variety.

D. Lastly, the author infers that "Gangrene of the lung may set in without any other than the apparently unimportant symptoms which characterize a slight pulmonary catarrh."

The author is especially anxious to draw attention to certain characteristic marks of the earlier stages of the disease described in his Essay, particularly the odour of the expectoration, which is, he says—

"At first flat and mawkish, but soon assumes a very peculiar character, to which I attach especial importance, as by its aid we are in a position to diagnose incipient gangrene, and it is a sign which I have not found described elsewhere." "It is characterized," he adds, "as a far from offensive, but, on the contrary, even very agreeable balsamic smell, most closely resembling that of myrrh. It is not very rarely observed, but has by no means been perceived in all cases. This circumstance I am, however, strongly inclined to attribute to attention not having been earlier drawn to it, as, since it was first perceived, it has been found in almost all the more recent cases. It may continue for a very long time." (p. 231.)

The next symptom on which Dr. Silfverberg lays particular stress, is the fact that the putrid cadaverous smell observed in the expired air at a later period of the disease, during ordinary respiration, is, at an earlier stage, perceptible, even simultaneously with the balsamic odour of the expectoration, on expiration during cough.

The third of the characteristic marks alluded to is, that

"After bronchial respiration has first appeared, there has, in all the accurately observed cases, occurred a period in which its strength is much diminished, or

when it may have altogether ceased. . . . But it often happens that the bronchial sound returns with increased intensity, as is seen in the first, and partially in the seventh example." (p. 235.)

Dr. Silfverberg gives the following statistics of the duration of pulmonary gangrene:

From 6	to	20 days in	5	cases.
„ 3	„	4 weeks in	3	„
„ 5	„	6 „	4	„
„ 6	„	7 „	4	„
„ 60	„	70 days in	3	„
About		90 „	1	„
„		130 „	1	„

V. Dr. Silfverberg's Essay is followed by a Paper by Dr. Fenger, entitled Practical Observations on Cardialgia and its Treatment. After an extended and interesting review of the several diseases in connexion with which cardialgia may sympathetically exist, Dr. Fenger alludes to its endemic occurrence in the North, and refers, on that subject, to Dr. Huss' excellent work 'On the Endemic Diseases of Sweden,' noticed at length in a former number of this Review.* Dr. Huss attributed the great prevalence of cardialgia in Sweden to the unwholesome and innutritious nature of the ordinary diet of the people, as well as to the abuse of brandy by the men, and of coffee by the women. Dr. Fenger doubts the correctness of this opinion, and argues that in Copenhagen the disease is very prevalent among the female servants, who in general are well fed, and certainly eschew "both sour bread and oaten bread and 'Krösamos.'"† The use of brandy, he adds, is unknown among this class; and coffee is not much more used by them than by other orders of the population, and certainly less than by the proper labouring classes, who diet themselves. Dr. Fenger considers that the cause of this endemic form of the disease, which he proposes to call Idiopathic Cardialgia, is still unknown, and that we are consequently not as yet in possession of any proper rational method of treating it.

The author considers at some length the principal symptoms of this form of disease, as tenderness of the epigastrium and other parts, sometimes including the dorsal vertebræ (spinal irritation), contraction of the recti muscles of the abdomen, epigastric pulsation, epigastric fulness, &c.; and concludes his valuable paper with judicious observations on the treatment of the affection, in the course of which he points out the efficacy of quina in the comparatively rare cases where the attacks of pain present a regular daily intermission. In the less regular forms of intermittent cardialgia, in which the attack of pain comes on at an uncertain period of the day, or perhaps altogether omits a day, the author has found much benefit from the use of nitrate of silver, administered in the form of pills, each containing one-eighth of a grain compounded with powdered marsh mallow. It is, in fact, in this particular form of cardialgia only that this remedy appears to be useful. He commences with three pills in the day, increasing the number in the course of a few days to ten or twelve,

* Vol. x. p. 365. The causes of the endemic dyspepsia, as assigned by Dr. Huss, will be found at p. 376 of the Review referred to.

† Sour milk, in which are boiled the berries of the whortleberry or bilberry. (*Vaccinium Vitis Idæa.*)

taking care not to continue their use for longer than a month, lest discoloration of the skin should be produced.

VI. We next meet a Contribution to the Theory of Emboli,* by A. Brünniche, Physician Extraordinary to Frederik's Hospital. The cases on which the author founds his remarks are two in number,—the first, that of a labourer aged fifty-four, is described as one of "dilatation with fatty degeneration of the heart, atheromata in the aorta, plug conveyed into the basilar artery, traces of hæmorrhage in the substance of the pons Varolii and left optic thalamus, abscesses in the perineum;" the leading features of the second, occurring in a servant girl aged twenty-one, were "arthritic fever, endocarditis, and hypertrophy of the left ventricle of the heart, emboli in the arteries of the pia mater, softening of the brain, hypertrophy and fibrinous infarction of the spleen, scurvy and deficiency of blood in all the organs; general dropsy."

"It may," observes Dr. Brünniche, "be considered as established by the foregoing cases, that embolism is really a diseased condition, capable of occurring under certain circumstances, and of giving rise to a series of morbid phenomena, which hitherto we have been in part accustomed to ascribe to other morbid processes, and which often even occasion death. It is therefore important to make ourselves more accurately acquainted with this disease, which has been nearly simultaneously described by Virchow in his 'Handbuch d. Spec. Pathol. und Therapie,' Band 1, Heft i., and by Dr. Senhouse Kirkes in the 'Medico-Chirurgical Transactions,' vol. xxxv., 1852.

"Every foreign substance which is conveyed in the current of the circulation to be deposited in another part of its course, may, in the widest sense of the term, be called embolus. Although, however, the theory of the reception of pus into the blood and its conveyance with its stream, has long played a part in pathology, and Kirkes also has described as a form of embolism the taking up by the blood of the finest molecular matters, which are, according to him, capable of giving rise to diseases of a purely typhoid character, it will yet be most correct for the present only to consider embolus as a more solid body of some palpable volume. Such may of course be any foreign bodies introduced from without, which are carried along with the stream of blood after having entered a vessel, or also natural or pathological products from the vascular system itself. Thus, portions of the valves of the heart, of atheromata, of ossifications, have been shown to act as emboli. Finally, what is most usual, fibrinous exudations or coagula of blood from the cavities of the heart or vessels.

"This transference of solid masses from one part of a vessel to another may naturally take place both in the venous and in the arterial system. As we must assume that the blood in the veins, by reason of its slower and more even course, the weaker impulse, and its more superficial situation, whereby it is more exposed to external influences, is more liable to coagulation, we should also expect that emboli should here more frequently occur. However, it is perhaps owing just to the greater weakness of its current that plugs are here less likely to be carried away, though it may be that this occurs more frequently than we suppose—at all events, this process has as yet been studied only under certain morbid conditions, as dropsies, phlegmasia alba dolens, &c., while it is possible that they may be conveyed from the veins, through the right side of the heart, to the pulmonary artery—a passage, the possibility of which has been demonstrated by experiments, and which might indeed explain certain cases of sudden suffocation; for example, during the puerperal state.†

* Emboli, from ἐμβολή, injection, a term applied by Virchow to fibrinous concretions detached from the heart or great vessels, conveyed in the current of the circulation to a distance, and arrested and producing obstruction in remote parts of the vascular system.—Rev.

† M'Clintock: L'Union Médicale. 1853. Dr. M'Clintock's paper here referred to, On Sudden

"In fine, we must look upon emboli as mainly an arterial phenomenon which at one time manifests itself in the pulmonary artery, when the plug comes from the right side of the heart, or through the latter from the veins; at another, in the arteries of the general circulation, when it proceeds from the route of the arterial blood—the pulmonary veins, the left side of the heart, or the larger arteries;—at another, in the ramifications of the vena portæ in the liver, when it arises in the roots of this vessel." (p. 333.)

The author proceeds to examine the courses which emboli are more likely to follow; the situations where they are more liable to be arrested; the predisposing and proximate causes of their manifestation; the immediate effects of their impaction; the changes they may subsequently undergo—either a kind of fatty metamorphosis, by which they are reduced to the state of a loose detritus, capable of being washed away piecemeal by the force of the circulation; or organization in the seat of their impaction, giving rise to ulterior results, some of which have been briefly described in a former number of this Review;* the symptoms to which they give rise according to the part affected; in a word, in a very few pages Dr. Brünniche presents his readers with an extremely lucid view of this interesting subject.

VII. "Some cases of sudden death in women during the puerperal state" (*Forplantningsperioden*) are next contributed by N. E. Ravn, Physician Extraordinary to the Lying-in Institution. The term puerperal state is here applied in its widest sense, comprehending the period of pregnancy, the act of parturition, and the time of subsequent confinement. The cases brought forward by Dr. Ravn are only two in number, and are placed on record as a contribution to the stock of facts on which future investigators of this important subject shall have to base their inferences. In the first case given, death is stated to have occurred suddenly from eclampsia at the time when labour was daily expected, though it had not yet commenced; nothing was found on post-mortem examination to account for the fatal result, except a highly-congested state of the brain; but the situation in which the body was found, with the face buried in the bedclothes, led to the suspicion that the patient had died from suffocation during a convulsive attack, in the absence of her husband, who had gone to seek for help; and in this opinion we ourselves, from a perusal of the case, feel bound to concur. In the second, headache, followed by convulsions and subsequent coma, without stertorous breathing, supervened during labour. About four ounces of blood were found in the ventricles of the brain. The case was therefore one of apoplectic eclampsia.

The subject of sudden death in the puerperal state has been very fully treated of by Dr. M'Clintock, the present Master of the Dublin Lying-in Hospital, in the communications referred to by Dr. Brünniche, and just now quoted. Dr. M'Clintock, in recapitulation, assigns the following as the probable causes which may operate in effecting this result:

"1. Idiopathic asphyxia; 2. The shock of parturition; 3. Syncope; 4. Mental impression; 5. Air in the veins and heart (?); 6. The formation of a coagulum in the heart; 7. Clots in the pulmonary artery: 8. Phlegmasia dolens; and 9. Morbus cordis."

Death in the Puerperal State, originally appeared in the Dublin Medical Press for 1852, in the form of two communications to the Surgical Society of Ireland.

* Vol. xi. p. 382.

It has also been subsequently considered at some length by Dr. Achille Dehous, in an inaugural thesis, published at Paris in 1854; and it was, in 1855, proposed by the Académie Impériale de Médecine, as the subject for a prize essay. To the facts already brought to light by the researches of these observers, no addition is here made by Dr. Ravn. Indeed, his paper does not add anything to the knowledge we had previously possessed upon this subject. In one of his cases, death was simply the result of an apoplectic effusion, and therefore presents no feature peculiar to the state of pregnancy or child-bed. In the other instance, the apparent and most probable cause of death was suffocation.

VIII. "Two cases of typhus observed at Frederik's Hospital by H. R. Magnus, practising physician in Hobro." The author says—

"The last time the question of the identity of typhus and typhoid fever was broached among us was, so far as I know, at the meeting of naturalists held here in 1847, when the matter was brought under discussion in reference to the result arrived at by the Danish Committee. The latter, basing their decision chiefly upon observations made at the General Hospital, had advanced the opinion, 'that similarity in the origin, symptoms, course, result, and ordinary treatment, tended to prevent the cases in which patches (*plaques*) and intestinal ulcerations are found, being attributed to a process essentially different from that on which the typhus fevers, where these anatomico-pathological affections are not found, depend.'" (p. 357.)

This decision of the Danish Committee is in accordance with the views generally held by the Dublin School—who have, unfortunately, peculiar opportunities for studying the severer form, or genuine typhus—as well as with the opinion formed by Dr. Lindwurm, now of Munich, who on two occasions visited Ireland for the special purpose of studying typhus in reference to the two questions of its contagiousness or non-contagiousness, and of the identity or non-identity of its several forms; and who

"Declared unconditionally for the view, that the diseases described as distinct species of typhus are only modifications of one and the same morbid process, of the essence and nature of which we are, however, ignorant."*

A change, nevertheless, caused chiefly by the observations of Dr. Jenner, appears to have come over the Danish mind in respect to this point, for Hr. Magnus continues—

"This opinion was, indeed, opposed; yet, so far as appears from the printed transactions, without the opposite view having been adopted. Since that time, however, our views have undoubtedly become further and further removed from those of the Committee, so that now certainly many, perhaps the majority, are no longer inclined to look upon typhus and typhoid fever as one form of disease. This revolution in opinion is indeed due, scarcely so much to our own observations as to descriptions received from abroad, for the genuine typhus occurs only exceptionally here; thus, so far as I have been able to learn, but five cases of this disease have been met with in Frederik's Hospital since 1846; and of these, three occurred in that year and the remaining two not until the present, consequently after an interval of seven years; and even these two did not originate in this country, but the first was imported by a Finnish sailor, who arrived in Copenhagen, sick, the day before his admission, and from him one of the hospital nurses took the fever." (p. 358.)

The cases were examples of the ordinary exanthematous typhus, but they do not throw much light on the point in question, as the sailor

* Der Typhus in Irland, &c.; and Dublin Quarterly Journal, vol. xvi. p. 129.

recovered, and the less fortunate nurse, on the ninth day, got an attack of Asiatic cholera, of which she died three days later, and there was no post-mortem examination. The author concludes his paper with some remarks on the fact of this disease having been communicated, while in an extensive epidemic of typhoid fever, during which, in the course of a couple of months, 160 typhoid patients were treated in the hospital: to use the words of Professor Trier, "Not an attendant of the sick, whether male or female, nor any one of the physicians, either resident in or visiting the hospital, was attacked by the fever." The extracts we have made from Dr. Magnus's paper appear to us to be interesting, as indicating the feeling of the profession in Denmark, upon the debated point referred to, and also as affording information as to the rarity of the occurrence of exanthematous typhus in Copenhagen:

"How far typhus may perhaps occur more frequently in the provinces, it is," says the author, "impossible to decide; for in the medical reports to the College of Health, the denominations 'typhus' and 'typhoid fever' appear to be used indiscriminately." (p. 359.)

IX. In a paper, entitled Progressive Muscular Atrophy with Fatty Degeneration, Dr. Brünniche, having reviewed the several opinions most recently advanced as to the pathology of this singular lesion, details the case of a man, aged twenty-eight, who was under his observation in hospital for about three months. The affection commenced, upwards of two years before his admission, with a feeling of weakness in the right shoulder-joint, with simultaneously-observed diminution of the bulk of the arm; the wasting and loss of power gradually extended to the fore-arm of the same side, and had, during the last six months, also invaded the left upper extremity. The author was of opinion that benefit was derived from the use of electricity; but the patient, weary of his stay in the hospital, and despairing of recovery, claimed his dismissal in order to return to the country. Dr. Brünniche points out that the loss of power evidently followed the atrophy, and not *vice versâ*, as would have occurred in a case of ordinary paralysis. There was no indication of any disease of the nervous centres, the patient's intelligence and senses were unimpaired, and electricity excited the affected muscles as long as they retained a trace of muscular fibre:

"The following circumstances," continues the author, "are also opposed to the view that the seat of this disease is in the nerves: first, that the muscles are attacked in portions at a time; secondly, the capricious situation of the affected muscles, which neither in my case nor in other similar cases, corresponded to particular distributions of the nerves; and lastly, that the paralysis is subsequent to the atrophy." (p. 384.)

Dr. Brünniche is hence induced to designate the disease simply as a lesion of nutrition of the muscular system.

Our experience does not accord with that of the author so far as relates to the second point referred to in the observations just specially quoted. In a case which came under the notice of the writer, and of which some account is given in the 'Dublin Quarterly Journal of Medical Science,'* the atrophy appeared to follow so accurately the distribution of the portio dura nerve of the left side, that Dr. Charles Johnson, under whose care the patient was,

* Vol. xiv. p. 245.

"Remarked that it would appear to verify the observation of Dr. Darwall, that the nerves of the human body had probably a third function in addition to the production of sensation and motion—viz., that of determining the nutrition of the parts they supplied; and that we might infer that in this case the portio dura had become paralysed as to its office of exciting nutrition, while its motor power continued unaltered."*

In this instance, too, the application of electricity appears to have been beneficial.

X. A case is next related by C. Müllertz of an enormous "hernia prorumpens inguinalis," so called "because it was a hernia in the inguinal canal, which had not extruded through its superior opening, but through an unnatural opening in its inner wall." The patient was twenty years of age; the peculiar course of the hernia was attributed to the presence and development of the undescended testicle in the inguinal canal; this organ was attached by the cord to the internal ring, so that even after death it could not be drawn further down; and although perfectly developed, it was incapable, under these circumstances, of filling the entire canal. A space of an inch in length was thus left between the inferior extremity of the testicle and the external ring, which was occupied merely by a very loose areolar tissue; moreover, it is to be supposed that the abdominal wall of the canal may have been attenuated by the pressure of the gland. The rupture, therefore, took place through the inner wall of the canal, below the testicle, but above the external ring, partly pressing the testicle upwards, and partly descending through the external ring into the scrotum. All efforts at reduction having failed, the operation for strangulated hernia was performed on the 2nd of August, at six P.M. Everything appeared to go on well until the 4th, when erysipelas set in, peritonitis supervened, and death ensued on the 11th at four in the morning.

XI. We have next an elaborate paper by Dr. Fenger, extending to a hundred and twenty-seven pages, upon 'The Masked Forms of Bright's Disease;' or those, according to the author's definition, which are not attended with dropsy. The proper characteristic mark of the affection he considers to be the existence in the urinary deposit, as proved by microscopic examination, of the so-called fibrinous cylinders. We can, of course, in here noticing so lengthy a communication, do little more than briefly point out the line pursued by the author in dealing with his subject. Dr. Fenger first describes the relation existing between uræmia and typhoid fever, a relation which he states to be of a twofold nature; thus we have cases where the symptoms closely resemble those of typhoid fever, while no such affection, but Bright's disease, is present. Again, we meet with instances where both diseases occur simultaneously, and run more or less evidently into one another. The author next passes to those cases which simulate organic disease of the brain, and are attended with a sub-apoplectic condition, epileptic convulsions, delirium, or coma. Dropsy occurring with characteristic urine towards the close of pregnancy he classes among the masked forms of the disease, because dropsy in pregnancy so often depends on other causes that its true nature may easily be overlooked.

* Op. cit., p. 246.

"Among the cerebral symptoms which may occur in the masked forms of Bright's disease, and become of importance for its diagnosis, must still be reckoned several more local nervous affections, of which the most important undoubtedly is a by no means uncommon *amblyopia* or *amaurosis*." (p. 455.)

The cases of Bright's disease simulating affections of the thoracic organs are next considered. Of some of these the symptoms closely resemble those of œdema glottidis. Such cases, like the disease they imitate, end in suffocation. Œdema of the lung, pneumonia, pleuritis, and bronchitis may also occur as the predominant feature in the latent forms of Bright's disease; pulmonary tubercles are also often present simultaneously with the same, as are diseases of the heart, especially hypertrophy with or without valvular lesion, hæmoptysis, and dyspnœa. Among the abdominal symptoms which may attend these forms of disease may be enumerated vomiting and diarrhœa, cardialgia, and those attending on affections of the liver and spleen.

The author concludes his paper with an examination of the opinions of Dr. George Johnson in reference to chronic Bright's disease, published in former numbers of this Review*—namely, that it presents two principal varieties, which he denominates respectively the desquamative and the non-desquamative form, the first accompanied with urine much less albuminous, and of much lower specific gravity than that secreted in the second variety, while the quantity of the excretion is not so much diminished as is most frequently the case in the latter, and is usually even increased. The kidneys on post-mortem examination are found to be of the normal size, or even smaller; they are moreover very firm, and sometimes even hard in their substance, of a more or less red, though most frequently very pale red or pearl grey colour, and are ordinarily granular on the surface. This form is seldom accompanied with dropsy, and the prognosis is much more favourable than in the non-desquamative variety, in which the kidneys are perceptibly enlarged, softer, and of a dull white colour studded with numerous yellow specks. In the non-desquamative variety, moreover, the quantity of urine is diminished, its specific gravity is often considerable, the albumen is abundant, and the deposit contains fewer epithelial cells and cylindric bodies, while the latter have undergone more or less of fatty change. In this form dropsy is always present, and usually exists to a great degree.

It will be seen that the state of kidney described by Dr. Johnson as existing in his non-desquamative variety is that formerly looked upon as characteristic of the so-called second stage of Bright's disease; while the condition in which it is found to be diminished in size, hard and granular, is that hitherto attributed to the so-called third stage. The author examined the kidneys in seven cases in which the disease proved fatal, with special reference to Dr. Johnson's statement, and from the results of his own investigations, as well as from a review of the observations of others, he concludes in favour of Dr. Johnson's opinion, that when an individual dies of Bright's disease without dropsy having been manifested—that is, in the latent forms—the kidneys will be found to be hard and contracted.

XII. We have next a contribution by Dr. Brünniche, 'To the Elucidation of some Disputed Points in the Theory of Pneumothorax.' The author

* Vol. xi. p. 56; and vol. xv. p. 122.

remarks that emphysema, though of frequent occurrence, seldom produces pneumothorax, notwithstanding that under its influence the walls of the air vesicles are very remarkably distended and attenuated; and he hence infers that when pneumothorax takes place, as a result of emphysema, a further cause of its existence must be sought. This he believes may be found in an effort, by a portion of the lung, to produce an equilibrium, and to compensate for the diminution of volume caused by a partial atrophy of the organ; the theory, in fact, by which Dr. Gairdner accounts in general for the production of dilatation of the heart and emphysema. In support of this view, he details at considerable length a case of "Tuberculosis of the bowels and lungs, progressive in the left lung, retrogressive in the right, with development of vesicular emphysema in the antero-superior portion of the latter, followed by the rupture of an emphysematous vesicle, pneumothorax, and death." The author observes that—

"The presence of phthisis was established, and the physical signs seemed to indicate that it had proceeded farthest in the left side, while the phenomena in the right lung might be taken as indicating an earlier stage of the same disease. Dissection, however, showed that the tuberculosis in the right lung was probably of longer standing; various forms of isolation of the deposited masses were present, and the pulmonary tissue around them was puckered and atrophied. As a consequence probably emphysema arose, to counterbalance the diminished bulk of the surrounding lung, and as this diminution was progressive, the emphysema continued to increase; some vesicles became over-distended, and burst. This case also affords an example of a peculiar mediate connexion between tuberculosis and pneumothorax, with emphysema as the connecting link, and is rather to be referred to the cases of pneumothorax which owe their origin to emphysema." (p. 542.)

The author shows that in 147 cases of pneumothorax enumerated in a table by Saussier, quoted in Monneret and Fleury's 'Compendium de Médecine,' fluid was absent in about sixteen; consequently, it existed in 89·11 per cent. of the cases, constituting the most usual complications, hydro- and pyo-pneumothorax. Of fourteen cases observed in the medical section of Frederik's Hospital, only two were free from fluid; hence the complication was present in 85·71 per cent., a result closely agreeing, it will be observed, with that given by Saussier.

"With reference to the termination of the disease, the co-existence of fluid does not appear to be very decisive. In the above-mentioned statistical synopsis, only sixteen of the 147 cases were cured, so that the disease may, on the whole, be regarded as very fatal. Of these sixteen, the majority were cases of pyopneumothorax, twelve having had their origin in pleuritic effusions, one from a wound in the thorax, one from rupture of the lung, while two were of doubtful character. The prognostic value of the collection of air is certainly very decided, while the recoveries referred to show that pneumothorax is at least not invariably fatal, as seems almost to be Valleix's opinion in his 'Guide du Médecin praticien.' Probably we shall be nearest the truth by saying that the diseases in the course of which an accumulation of air in the pleura takes place, thereby acquire, in most instances, a fatal complication, that the degree of danger depends scarcely so much on the co-existence of an accumulation of fluid, as on the magnitude and diffusion of the collection of air, and above all, on the nature of the disease whence it has been developed.

"Thus authors are agreed that pneumothorax developed from tuberculosis of the lung is never cured; on the other hand, it would appear, from what has been

mentioned, that that occurring from without, by the rupture of an empyema or from a wound of the thorax, admits of a more favourable prognosis; circumstances which are certainly due to the nature of the disease producing the pneumothorax, its more or less destructive character, the state of exhaustion in which the extravasation of air generally finds the patient, &c. We should consequently be inclined to consider the prognosis to be most favourable in cases in which the affection depends upon a rupture of the lung, without previous disease of the latter. Such examples are, however, so rare, that they cannot be statistically entertained." (p. 545.)

In illustration of these remarks, the author records a case of the sudden occurrence of pneumothorax in the right side in an apparently healthy man, with circumscribed exudative pleuritis, terminating in recovery, and he concludes his paper with lengthened observations upon it, into the consideration of which our space does not permit us to enter.

XIII. The last paper in the volume, On the Abortive Treatment of Zona, by Dr. E. Fenger, is rather suggestive of the possible efficacy of the application of collodion in arresting the development of herpes Zoster, than a report of the author's experience on the subject, this having, at the time he wrote, been confined to a very few cases; and he therefore invites the co-operation of the profession in establishing a series of trials in reference to his proposal.

We have endeavoured, in the foregoing pages, to bring before our readers such a sketch of the "Hospital Communications" of our Danish brethren, as may enable them, each for himself, to form an estimate of the value of the interesting essays contained in the volume we have been reviewing. In thus attempting a survey of the whole, we have been prevented entering as fully into some of the papers as the importance of their subjects would, properly speaking, demand, and we have consequently been unable to render to the writers the full justice we should have wished, under the circumstances, to have extended to each. We can only say, in concluding a task which has been to ourselves a source both of pleasure and of interest, that in our opinion, the first volume of the new series of the 'Hospitals Meddelelser' bears on every page the impress of the ability, sound judgment, accuracy, and truthfulness, we have long admired in our Scandinavian colleagues; and we only hope that the learned editor will not unreasonably avail himself of the latitude afforded by the regulations under which they are published, and too long deprive us of the gratification of noticing his subsequent volumes in the pages of this Review.

Review IV.

Museum Anatomicum Holmiense. Quod auspiciis Augustissimi Regis Oscaris Primi, ediderunt Professores Regiæ Scholæ Medico-Chirurgicæ Carolinensis. Sectio Pathologica. Fasiculus primus, continens casus x., cum xii. tabulis.—*Holmiæ*, 1855.

The Anatomical Museum of Stockholm. Edited under the auspices of His Majesty Oscar I., by the Professors of the Royal Medico-Chirurgical School. Pathological Section. First Part, containing ten cases, with twelve plates.

We have had numerous occasions of drawing the attention of our readers to the valuable productions of our Scandinavian brethren; we are again called upon to express to them our thanks for a work which, as far as it has yet appeared, fully justifies the reputation they already possess; while, on account of its object, and the dress in which it appears, it will prove as useful to the Englishman as the Swede; at least, we would hope that the same facility of reading Latin prevails among ourselves as in the land of the Northmen. Should it not be so, we would express a wish that, with the revision of the whole medical education of this country, some steps may be taken to insure the revival of the vernacular employment of the Latin tongue among medical men, which, as a means of intercourse with scientific men of other countries, and as a means of clinical instruction in the presence of the patient, has great claims upon our consideration.

The 'Museum Anatomicum Holmiense' is a collection of tinted lithographs, taken from important preparations in the Anatomical Museum at Stockholm. It is published at the expense of the King, at the immediate suggestion of the Bishop Genberg, and the President of the Medical College, Dr. Eckströmer. The professors of the Royal Medical School are the parties responsible for the work. Among them our readers will meet with some familiar names; they are—A. Retzius, P. F. Wahlberg, C. G. Mosander, M. Huss, F. Th. Berg, M. C. Retzius, C. Santesson, P. H. Malmsten.

The work is to appear in parts, at irregular intervals; the size of the parts, and apparently the extent of the entire work, is undefined, and will probably depend upon the specimens at hand, and the convenience of the writers. The first number contains twelve excellently executed delineations, representing the subject in natural size, accompanied by an account of the case from which it was obtained, and a minute description of the preparation. They are all valuable illustrations of disease. The most remarkable are probably a case of hypertrophy of a portion of the glandular structure of the stomach (true mammillary hypertrophy), a case of epithelioma of the stomach, and a case of intestinal calculus. A brief description of these three may not be unacceptable to our readers.

The first occurred in a married woman, aged forty-two, who, in spite of great poverty, had, with the exception of frequently recurring pyrosis, always enjoyed good health. Five years before coming under observation, the pyrosis becoming more urgent, she was frequently attacked with

vomiting, when she brought up her food at longer or shorter intervals after it was taken, but without hæmatemesis; her strength gradually failed, chronic dysentery and œdema supervened, and death ensued. The stomach was the only organ which exhibited any marked disorganization. It was of the normal size. The whole of its mucous membrane presented an ashy-green colour, with a tawny hue towards the pylorus. The pyloric portion was covered with papillæ or tuberiform projections, at some parts separated from one another, at others closely packed together; they diminished towards the middle of the stomach, and the fundus exhibited a level surface. A vertical section showed the enlargement to be almost exclusively due to the glandular structure, constituting a genuine hypertrophy of the mucous membrane. There was no trace of pseudo-plasma, induration, ulceration, or erosion. The sub-mucous tissue was normal in the affected parts, but the muscular coat a line and a half in thickness. The apices of the villi were tumefied, giving the membrane the appearance of velvet. The hypertrophied tubes were gorged with epithelium, but the epithelium presented nothing abnormal. The solitary glands of the large intestine were enlarged, and ulcers were found in the descending colon.

The epithelioma occurred in a female, aged fifty-seven, who, up to the year preceding her death, had enjoyed good health; she then was seized with intense headache, lasting day and night, with severe constipation, and loss of appetite. Œdema of the feet, the right hand and eyelid, supervened. She became very cachectic and feeble; but the tongue remained clean and soft; there was no vomiting; the abdomen soft; there was no tenderness, nor could a tumour be discovered. The symptoms pointed almost exclusively to disease of the brain and right lung.

The autopsy showed numerous bony formations in the longitudinal sinus, and the lower portion of the right lung was in a state of grey hepatization. The stomach was contracted, and contained two large pediculated tumours, arising from the posterior wall, and being directed towards the pylorus. The long diameter of the larger tumour was nearly five inches, that of the lesser about one inch. The conical peduncle of the larger tumour proceeded from the lesser curvature near the cardiac orifice, and was almost covered by the tumour itself, which also presented a conical form. The surface of the latter exhibited a cauliflower appearance, and consisted of fimbriæ, folds, and long laciniæ and villi. The folds were in many parts disposed concentrically, so as to look like roses. The petiole of the lesser tumour was also conical, and presented several folds. This tumour resembled a powder-puff, the surface being cut up into long, narrow laciniæ. Both tumours were of a greyish-red hue. A section showed an internal alveolar structure; the alveoli diminished in size in proportion to their proximity to the base. The alveoli contained a mucous fluid, with cylindrical epithelium and nuclei, some of the size of blood-corpuscles, some less. There were but few larger vessels; but a scanty network of minute vessels and capillaries was observed. The superficial portions consisted of epithelium and cell-nuclei, which were in contact with several layers of pellucid corpuscles of a circular or oval shape, four times the size of blood-corpuscles. There were also numerous small pellucid corpuscles, probably the nuclei of unformed epithelium.

The parietes of the alveoli consisted of an almost structureless membrane, around which lay nuclei, cells, and fibres. The more one approached the centre of the tumour, the more it presented a fibrous texture, consisting of flat fibres, which were in many parts manifestly made up of fusiform corpuscles, with and without nuclei. Fat molecules were extensively dispersed throughout all the corpuscles. The authors observe that the case is an illustration of epithelial cancer, or what has been perhaps more appropriately called by Hannover, Epithelioma.

The case of intestinal calculus is a rare specimen of the development of an enormous concretion, which formed in the caput cæcum and appendix vermiformis of a labouring man, aged twenty-two. It was passed per anum after intense suffering, the dislodgment having been apparently effected by the use of seal oil, which the patient prescribed for himself after having been under the hands of medical men to no purpose. The calculus weighed fourteen ounces and a quarter, was nearly seven inches long, and above two broad. Its shape was moulded to the vermiform process and the cæcum, which it had occupied. The surface was granular, exhibiting impressions of the mucous membrane. About the middle of the concretion was a minute cavity, about 0·1 inch (4 millimètres) in diameter, containing a small coagulum, round which the calculous matter was arranged concentrically as far as the surface; the further accession of calculous matter in the direction of the two ends of the concretion also exhibited a generally concentric arrangement round the coagulum, but the circles were necessarily not completed. The layers surrounding the coagulum were alternately tawny and containing a hairy substance, and yellow, more solid and earthy. This alternation was particularly regular for the first six layers, the hairy layers being less broad than the others. The hairs, on microscopic examination, were found to be the hairs that invest the caryopsis of oats.

The following is the chemical analysis of the inner layers:

Matters soluble in ether	1·58
Soapy matters soluble in pure alcohol, the bases of which were soda, lime, and magnesia	0·30
Fatty salts and acids soluble in water	5·20
Water mixed with the above salts	0·72
Sub-phosphate of lime, phosphate of magnesia, with traces of iron and manganese	77·50
Silicic acid	0·70
Hairs of caryopsis of oat	14·00
	100·

Other portions of the concretion were found to contain a small amount of carbonate of lime. No biliary matter could be found in any part.

Before concluding this article, we may also allude to a very interesting specimen of a pedunculated calculus of the bladder. It was discovered in the body of an old woman, of whose previous history nothing was known. The peduncle and the nucleus of the calculus was a fibrous polypus growing from the upper and back part of the bladder; the peduncle from which the calculus was suspended was half turned upon its axis. The base of the calculus was broken off, the fragments probably

having passed off by the urethra. What remained was nearly three inches in its longest, and two inches in its broadest, diameter, and presented an elliptical shape. It nearly half filled the bladder, which exhibited considerable thickening in its muscular and mucous coats.

It remains for us to express a hope that we may soon have occasion to announce to our readers a continuation of a work alike conspicuous on account of its artistic elegance and its scientific merits, and equally creditable to the Government under whose auspices it is commenced, as to the gentlemen more immediately concerned in its execution.

Review V.

1. *A Manual of Medical Jurisprudence for Bengal and the North-Western Provinces.* By Norman Chevers, M.D., Secretary to the Medical Board, Fort William.—*Calcutta*, 1856.
2. *A Treatise on Removable and Mitigable Causes of Death, their Modes of Origin and Means of Prevention; including a Sketch of Vital Statistics and the leading Principles of Public Hygiène in Europe and India.* By Norman Chevers, M.D., Bengal Medical Service. Vol. I.—*Calcutta*, 1852.

Happy is the country the Government of which respects and encourages science, and in which men of science are to be found in the public service respected and rewarded. We make this remark after the perusal of the works which we are about to notice, the titles of which are given above; both by the same individual, both written in Bengal, and one, the former, published by order of the authorities in power.

Nowhere is there ampler scope, a larger field for the beneficial exercise of science, than in our Indian empire, whether we consider the vast tracts of country it comprises, their varied climates, their varied productions, and, what is more important, their various races and phases of society and of civilization. The extension of this empire from its insignificant small beginning to its present magnificent amplitude, with its gradual organization from a trading company of merchants into an imperial government such as it now is, is surely one of the greatest marvels of history, and one of the most memorable triumphs—may we not say of intellect over brute force, of honesty and honour over their contraries; in brief, of a higher principled and more advanced race over an inferior, especially morally and religiously viewed.

Amongst those who have been mainly instrumental in the great cause of improvements in India, no class of the Company's servants has, we believe, deserved better than its medical officers. Most of our knowledge of the country, as regards its natural history, we owe to them. If we have at all gained the affections of the people, it has been chiefly through them. And one of the most promising indications of the spread of sound knowledge, and the substitution of science for ignorance and a degrading and brutalizing superstition, is opening out in the establishment of medical schools and colleges for the education of native youths in the medical profession, conjoined with the privilege granted them of admission, when qualified, into the public service.

The cognate works before us on those great subjects, medical jurisprudence and public health, are good examples of the beneficial exertions we have been alluding to, and, we have pleasure in adding, of the zeal likewise, and industry and ability of their author. He informs us, in the preface to the latter, that the larger portion of the materials of the treatise was collected at Chittagong, "during the unfrequent intervals of leisure allowed by extensive medical duties." Greatly is this to his credit; honour is due to him, and we rejoice to see that his labours have been approved, and that he now has the appointment of Secretary to the Medical Board, an office, for the credit attached to it, hardly second to any in the department to which he belongs; and perhaps superior to any as regards the importance of the duties connected with it, and for which we are sure he has been selected not on account of seniority of standing, but on account of merit and fitness.

Of the author's works which we have undertaken to review, our notice, from their very nature and the limited space only that can be allowed them, must be briefer than we could wish. We shall commence with his 'Manual of Medical Jurisprudence,' which, we need hardly observe, owes its interest and importance to its being written expressly for India, for Bengal, and the North-Western Provinces. In the preface, Dr. Chevers remarks, speaking of his performance, which he modestly calls a sketch, that it is "avowedly a very slight and imperfect one; still, it is believed that it is the first that has been attempted, and it is trusted that it will at least serve to demonstrate the importance which would attach to a thoroughly complete and elaborated history of crime in India." This certainly it does, and till we have such a history, it may well supply its place. It is rich in facts and original observations, the opposite of "a barren epitome," and only requires to be extended to be all, or nearly all, that its author, in his highest aspirations, could wish for; and let us indulge the hope that he may live to complete it to his heart's desire.

In an historical point of view, as throwing light where there is most darkness—the privacies and mysteries of Indian society—this work is specially interesting: interesting and distressing, from displaying so much vice, so much corruption, brutality, and crime, filling the mind with horror, and making one ashamed of our common human nature. Here is the character of the people, given by two distinguished historians, who had lived amongst them, and from their situations and opportunities were very competent to form a correct judgment, nor likely to set down aught in malice:—

"The *Rajpoots* are the representatives of Hinduism. In them are seen all the qualities of the Hindu race unmitigated by foreign mixture, exerted with their original energy, and displayed in the strongest light. They exhibit the genuine form of a Hindu community, formed of the most discordant materials, and combining the most extraordinary contrasts of moral nature: unconquerable adherence to native opinions and

"The physical organization of the *Bengalee* is feeble, even to effeminacy. He lives in a constant vapour-bath. His pursuits are sedentary, his limbs delicate, his movements languid. During many ages he has been trampled upon by men of bolder and more hardy breeds. Courage, independence, veracity, are qualities to which his constitution and his situation are equally unfavourable. His mind bears a singular analogy to

usages, with servile submission to any foreign yoke; an unbelieving priesthood, ready to suffer martyrdom for the most petty observance of their professed faith—a superstition which inspires the resolution to inflict or to suffer the most atrocious barbarities, without cultivating any natural sentiment or infringing any social duty; all the stages in the progress of society brought together in one nation, from some abject castes more brutal than the savages of New Zealand, to the polish of manners and refinement of character conspicuous in the upper ranks; attachments to kindred and to home, with no friendship and no love of country; good temper and gentle disposition; little active cruelty, except when stimulated by superstition; but little sensibility, little compassion, scarcely any disposition to relieve suffering or relieve wrong done to themselves or others; timidity, with its natural attendants, falsehood and meanness, in the ordinary relations of life, joined with a capability of becoming incited to courage in the field, to military enthusiasm, to heroic self-devotion. Abstemiousness, in some respects more rigorous than that of a western hermit, in a life of intoxication; austerities and self-tortures almost incredible, practised by those who, otherwise, wallow in gross sensuality; childish levity, barefaced falsehood, no faith, no constancy, no shame, no belief in the existence of justice." (Mackintosh.)

his body. It is weak, even to helplessness, for purposes of manly resistance, but its suppleness and tact move the children of sterner climates to admiration, not unmingled with contempt. All those arts which are the natural defence of the weak are more familiar to this subtle race than to the Ionian of the time of Juvenal, or to the Jew of the dark ages. What the horns are to the buffalo, what the paw is to the tiger, what beauty, according to the old Greek song, is to woman, deceit is to the Bengalee. Large promises, smooth excuses, elaborate tissues of circumstantial falsehood, chicanery, perjury, forgery, are the weapons offensive and defensive of the people of the Lower Ganges. All those millions do not furnish one Sepoy to the armies of the Company. But as usurers, as money-changers, as sharp legal practitioners, no class of human beings can bear a comparison with them. With all his softness, the Bengalee is by no means placable in his enmities, or prone to pity. The pertinacity with which he adheres to his purposes yields only to the immediate pressure of fear. Nor does he lack a certain kind of courage, which is often wanting in his masters. To inevitable evils he is sometimes found to oppose a passive fortitude, such as the stories attributed to their ideal sage. An European warrior, who rushes on a battery of cannon with a loud hurrah, will sometimes shriek under the surgeon's knife, and fall into an agony of despair at the sentence of death. But the Bengalee, who would see his country overrun, his house laid in ashes, his children murdered or dishonoured, without having the spirit to strike one blow, has yet been known to endure torture with the firmness of Mucius, and to mount the scaffold with the steady step and even pulse of Algernon Sydney." (Macaulay.)

In these descriptions of the character of the people, the antithesis of style and fine writing might make one doubt their correctness, were it not confirmed by the prevailing vices and by the crimes committed, as evidenced in every page of the criminal reports.

"Theft, perjury, personation, torture, child-stealing, the murder of women and aged men, assassination, arson, the butchery of children for the sake of their ornaments, drugging and poisoning, adultery, rape, unnatural crime, the procuration of

abortion, are among the leading villanies of these ingenious, calm-tempered, indolently-pertinacious sensualists."

These are the words of the author; and he adds, in corroboration, that—

"It is only by thoroughly knowing the people, and by fixing the mind sedulously upon the records of their crimes, that an European can learn how strange a combination of sensuality, jealousy, wild and ineradicable superstition, absolute untruthfulness, and ruthless disregard of the value of human life, lie below the placid, civil, timid, forbearing exterior of the native of India."

He further states "that the women are even more ignorant and brutalized than the men; that the belief in woman's virtue or man's honesty does not exist amongst them;" and that between the Hindus and the Mussulmans there is little difference in the characters of the offences recorded against them. The darkest period of the night, and its most chilling, is that nearest the dawn. Amidst this intensity, as it seems, of national depravity, there is one peculiarity, which we would fain hope may be viewed as a qualifying and extenuating, if not a redeeming circumstance. The Committee on Prison Discipline remark in their Report (that of 1838):

"An Indian criminal is probably a better man than any other criminal of the same sort. His general character certainly differs less from that of the mass of his countrymen than would be the case in more civilized and moral countries."

Adding:

"A large proportion of the crimes in this country are committed by persons whose tribe have done the same time out of mind; and they are almost as naturally the result of birth as another man's honest trade. Many more are committed, as it were, professionally, by members of immense confederations, who are not much worse than other people in matters unconnected with their profession, owing to feelings which we can never [?] comprehend. There is little or no consciousness of moral guilt amongst these classes, on account of the exercise of what they regard as their proper business."

If this statement be correct—tending to show how weak is conscience opposed to habit; and it is in accordance with all our experience of mankind, whether we direct our attention to the usages of the early Britons and their human sacrifices, or to those of the New Zealanders in our own times, so recently cannibals—we ought not to despair of the people of India, nor consider them incapable of acquiring a better mental condition under an efficient moral and religious training and education, such as have been so successful amongst the savages just mentioned, and in our ragged schools and our reformatory institutions. Without this hope, *ad meliora*, ought we not to consider the possession of the country an evil, and the ruling over it a temptation and a curse, pregnant with evil to ourselves? But far be from us this despair! Let us keep in mind that man everywhere is very much the creature of circumstance; under good influences having the virtues of humanity elaborated, and *vice versâ*. Of these influences, none are more powerful than just laws, having for their end the suppression of crime; and to such laws no help is greater than the science comprised in medical jurisprudence.

Written as Dr. Chevers' work professedly is, for India, its arrangement, the subjects treated of, accord with the prevailing vices and crimes of the

people. Referring to the table of contents, the topics which meet the eye as most peculiar are—*poisoning*, in its multifarious ways, and for diverse purposes (no less than forty-three different poisons are named which are procurable in the bazaars of the country); wounds, including *torture*, variously administered; *human sacrifice*; the bites of venomous serpents; under the head of asphyxia, *burying alive*; under insanity, *running amok*, *fanaticism*, and *religious monomania*. These, and the ordinary matters belonging to medical jurisprudence, are preceded by some judicious remarks on the character of the people—to which we have adverted; on the transmission and examination of wounded persons and of dead bodies; on medical evidence, and on the uncertainty of general evidence in India; on the search for the bodies of missing persons; and on the declaration of the dying. The rules accompanying, and the remarks themselves, cannot fail of being useful to those for whom they are chiefly intended—the officer of police and the medical officer, whose assistance may be required in the cause of justice; and what is very valuable, they are in most instances illustrated by cases, some of them of a very curious and extraordinary kind. We shall give a specimen: it is under the head of Identity of Bodies, and is very Indian and characteristic.

"A very prevalent crime amongst the natives of Bengal, is that of causing a person to disappear, and of charging some obnoxious individual with his murder; a putrid corpse, readily procurable from the river, and disfigured with wounds, being perhaps brought forward as that of the lost individual. Upon the examination of this body the medical officer can probably do little more than report that the remains are those of a male or female, young or old, upon which he observes certain wounds, regarding which he cannot venture any opinion as to whether they were inflicted before or after death. Here the safety of the accused is, of course, imperilled; unless, as has not unfrequently happened, his alleged victim be speedily produced in full life and vigour. The most recent case of the kind is, I believe, that recorded in the 'Nazamut Adamlut Reports,' Part 1. of 1853, p. 259, in which 'certain of the prisoners were convicted, on their own confessions, of perjury, in having falsely deposed to the fact of a murder, and burial of the corpse, in a trial, at the conclusion of which the alleged deceased made his appearance in court.' 'It would be impossible,' writes the sessions judge in his report of this trial, 'to imagine a case more completely satisfactory, as regards, at least, the guilt of Abdost Kurrem [the unfortunate accused], than this became when the daragah's report was completed, and as, in fact, it remained, until the appearance of Pertaubnarain [the murdered man] brought to light its real character. The prosecutrix was the mother of the missing man; the principal witness was his wife, Shearasattee, and his cousin, Kanaram; while the prisoner's own servants detailed at length the circumstances attending the burial of the body. There were no inconsistencies and no contradictions in the evidence, which from first to last gave the hearers the impression, that a heinous crime had indeed at last been brought to light, in spite of a powerful combination to conceal it.'"

Under the head of Search for the Bodies of Missing Persons, are many striking instances given in illustration. The following remarks, though specially applicable in a hot climate, are in their bearing worthy of attention in every climate; and we quote them on that account, and as affording a good example of the author's style and acumen. As in most other instances, they are supported by cases, many of them of a remarkable kind, confirmatory of the belief that

"Murder hath speech, and will declare itself
With most miraculous organ."

"'Wheresoever the body is, there will the eagles be gathered together,' is a fact which has daily illustration in India, and which has often been turned to good account in searches for the remains of missing individuals. . . . . I have long thought," he continues, "that the common pariah dog of the country, and very possibly the vulture also, could be trained for the discovery of missing bodies. The dog would probably be found tolerably manageable, but could rarely be useful in cases where the corpse lay at a considerable distance. The keener sense and the wider visual range of the vulture would tell far more advantageously; and although this bird appears to be absolutely untameable, small supplies of food will generally induce it to resort to a particular locality, where its movements can nearly always be under observation. Indeed, a tree resorted to by vultures, will be found in the neighbourhood of every station; and a look-out for the direction in which the birds left or returned thither, might often assist a search."

In the chapter On Poisoning—a crime, it would appear, extremely rife in India, from the earliest recorded period to the present time—much valuable information is given. According to Strabo, the author remarks, the burning of Indian widows was enforced to check the women's practice of poisoning their husbands; and Captain Hamilton, who traded in India between 1688 and 1723, notices a legend in which the custom is similarly accounted for; how, before the law was enacted, poisoning was so well known and practised, that the least quarrel that happened between a married couple cost the husband his life.

"Thuggee of travellers by poison" is one of the peculiar crimes of the country, and practised, we are assured by the author, throughout the three Presidencies, in which it is pursued systematically as a trade, and is not merely the device of a stray criminal—especially since the check given to Thuggee,—Burking (to use our synonyme) by strangulation. Amongst the evidences the author brings forward in proof of the frequency of the crime, he quotes Colonel Sleeman, who, writing in 1844, "expressed his belief that no road was free from poisoners; and that throughout India there must be many hundreds who gained their subsistence by that trade alone."

Poisonous snakes, formidable enough in themselves, but how much less so than those inhuman poisoners just referred to, have very properly had the attention of the author as a medical jurist. He makes mention of twelve different species known in Bengal and the Bay of Bengal—some terrestrial, some pelagic—the latter, there is reason to infer, more ferocious, that is, more disposed to attack man, than the former, which seldom or never, we believe, strike, except on the defensive. It is conjectured that a vast amount of undiscovered crime is concealed in India under the always plausible and not generally controvertible report of "Died by snake-bite"—a belief confirmed by the fact of the disparity in the number of reported cases of the kind, and of well-authenticated cases. Thus, whilst in one district of Bengal alone, the number of deaths attributed to this cause by the magistrate amounted to 402 in twenty-one months, not a single case of snake-bite had been admitted into the General Civil Hospital in Calcutta during the preceding thirty years:—a contrast the more remarkable, since poisonous snakes are nowise unfrequent in that town and its vicinity.

In treating of the effects of this animal poison, we perceive that Dr. Chevers has adopted the common opinion, that they are much the same in kind, irrespective of the species of snake inflicting the poisoned wound.

This we are satisfied is not the case, and we found our conviction of the contrary on our own experience, derived from trials made with the three poisonous species which occur in Ceylon;—trials which we instituted whilst stationed in that island many years ago, and which we published at the time.* The results decidedly proved that the poison of each kind acted differently on the animal experimented on. Should the author's work come to a second edition, as we have no doubt it will, we venture to express the hope that he will reconsider the subject, as an error of this kind must vitiate and render useless, and worse than useless, all inquiry in doubtful cases of "snake-bite."

Torture in India has but lately, indeed only within the last twelve months, excited a home interest, and has been in a manner ignored, yet, strange to say, the practice of it has never been discontinued.

"We have abundant evidence," says the author, "that this atrocity has now become intimately blended with the customs of all sects and classes of natives throughout India. The poor practise torture on each other; robbers on their victims, and *vice versâ*; masters upon their servants; zumindars upon their ryots; schoolmasters upon their pupils; husbands upon their wives; and even parents upon their children."

A like remark applies to "human sacrifice," which, we are assured by Dr. Chevers, is still perpetrated, notwithstanding all the exertions of Government. "This crime," he sayr, "doubtlessly is less prevalent than formerly; but there are strong reasons for believing that there is scarcely a district in India in which human sacrifice is not still practised as a superstitious rite," and this "altogether apart from those of suttee and female infanticide." He adduces instances in proof of a terribly revolting kind.

On the complicated subject of wounds and injuries—whether inflicted before or after death, whether or not self-inflicted, whether by wild animals, whether by weapons in common use; further, as to the manner in which inflicted—as, by hacking the neck, decapitation, cutting the throat, fractures and dislocations, gun-shot wounds, mutilation—deaths from beating, &c.—much varied and curious information is given, alike illustrative of the criminal propensities of the natives and their debased moral nature—information which every medical officer serving in India should be familiar with, and portions of which may be advantageously known to the medical practitioner at home, to secure him, if called on to give evidence in court, from serious mistakes; such, for instance, as the remarks on the colour of cicatrices in the persons of negroes, and those on the causes of death in cases of injuries not in themselves of an essentially fatal character, followed by death. Regarding the first, it has been asserted recently, and even by medical jurists of deservedly high reputation, that in the healing process of wounds, in the instance of the dark-coloured races, the *rete mucosum* is not restored, and consequently that the cicatrix remains white; whilst in fact, as Dr. Chevers has satisfied himself, confirming the observations of Mr. Lawrence made long ago, that in process of time it (the cicatrix) becomes darker even than the adjoining skin. Regarding the second, he states,

* See Researches, Physiological and Anatomical, vol. i., by John Davy, M.D.

"About ten years since I went carefully over the whole of the records at Guy's Hospital of cases in which injuries and surgical operations, not in themselves of an essentially fatal character, had been followed by death at periods of a few hours or days, during a period of fifteen years. The results were, out of 153 cases which had occurred in the hospital, death had resulted from inflammation of internal organs or secreting surfaces (including the liver and spleen) in 143 instances. In the remaining 19 the patients died from other causes, such as tetanus, sloughing, hæmorrhage, suppuration, gangrene, erysipelas, diarrhœa, and total deficiency of reparative action in the wound. In one only the precise cause of death was not ascertained. Out of these 153 cases, there was marked disease of the spleen, liver, and kidneys in 93 cases. In the 143 cases of death from internal inflammations, there was also superadded marked disease of the spleen, liver, and kidneys, or of all these organs at once, in 90 cases."

Had such a return as this been called for in the House of Commons when, some years ago, a death after flogging in the instance of a soldier at Hounslow was discussed, the decision arrived at might have been more just; but then, as too often is the case, public clamour stood in the way of sober inquiry. And here we would remark, that were an analysis made, after the manner followed by Dr. Chevers, as to the cause of death in cases proving fatal in hospital—comprising a large number admitted with slight ailments—the results could hardly fail proving instructive and highly useful, were it merely in their tendency to check rash and hasty conclusions.

The chapter On Infanticide, the last we must notice, is peculiarly interesting; and in the facts adduced, connected with sex, specially characteristic. The author remarks,

"The murder of female children, whether by the direct employment of homicidal means, or by the more inhuman and not less certain measures of exposure, privation, and neglect, has for ages been the chief and most characteristic crime of six-sevenths of the inhabitants of British India."

What a contrast is presented in the following passage, and in the statistical statements in the subsequent one! And how grateful we should be that, as a people, we are not exposed to the same terrible influences and temptations! More than that, how earnest should be the efforts of all who are officially employed in India, to oppose and abolish a system fatal to all natural affections, and in its reflex action no doubt contaminating society, and degrading it to the very depths of brutality.

"By the Hindu the advent of a female child is superstitiously regarded as a curse, and is practically viewed as a tax and a misfortune. The daughter, so welcome in the English peasant's homestead, so fondly greeted as the crowning honour and presiding grace of every European family of gentle blood, is viewed alike by Hindustani, Rayot, and the Rajput thakoor, as a certain presage either of poverty or of shame hereafter. The daughter of the Hindu must always be dependent upon others for her support; she must be suitably married, and a crime will be involved in the postponement of her nuptials beyond the age of childhood. At her husband's death she must trust solely to the support of others; and her conduct must be watched with unceasing vigilance, lest shame, with all its direct accompaniments—feud, revenge, and murder—should be entailed on her house. . .

"The results of this condition of things," the author continues, "may be set forth in a single paragraph. It is clearly established that in every country in Europe there is an excess of females. The census of 1851 showed that throughout Great Britain and Ireland the number of males then amounted to only 48·2 of

the inhabitants. The recent census of the North-West Provinces of India gave 53·4 as the per-centage of males in a population of 30,271,885; while the official census of Mysore, for 1852, showed that in a population of 3,410,382, the number of adult males exceeded that of females by nearly ten per cent., while the excess of male infants was sixteen per cent!"

We have marked other passages for quotation, but restricted as we are for space, we must pass them over; and this we do the more readily, feeling confident that such of our readers who are specially interested in medical jurisprudence will consult the work itself, which, we have no hesitation in saying, is not only valuable for use in our Indian possessions, but—to bestow on it higher praise—is valuable also in contributing, by the original matter it contains, to the advancement of science.

We have spoken of medical jurisprudence and public hygiène as cognate sciences: so, truly, they are. The limits between them are hardly sensible, their differences consisting mainly in the circumstance that, in the instances, the cases coming under the one, there is a presumed criminal intent, whilst in those of the other, that intent is absent; and further, accordingly, that whilst the one is concerned chiefly in endeavouring to prevent and detect offences committed by individuals on individuals, the other is occupied in discovering and removing noxious causes endangering the health and lives of the many. Both, in relation to the interests of society, are of the highest importance—are, indeed, vitally important; a consciousness of which, we are happy to think, is daily becoming more and more acknowledged; allowing us to indulge in the hope, that the time is not far distant when this feeling of their importance will be so strongly impressed on the public mind, that each will be held to be a fit topic for instruction, and enter into the curriculum, not only of our colleges but also of our public schools—at least, the elementary principles of hygiène. Both of them, as sciences, are of modern origin. Half a century ago, even medical jurisprudence was not taught in any of our medical schools. It is little more than forty years ago that we attended the first course of lectures ever given on this subject in a British university; and at present we are not aware that, in any one of our universities, there is a chair solely devoted to hygiène. The connexion between the two is well shown in the works of Dr. Chevers, now before us. In the perusal of the latter, we have had much the same satisfaction as we experienced from the former. The subject-matter being more popular, affecting the interests of all, the author, in his treatment of it, has addressed himself, and very properly, as much to the public as to the members of his own profession, and in a more discursive manner than he has observed in the preceding, and more supported by statistics (for most part given in foot-notes); using a style always vigorous and animated, and often eloquent. The first of the two promised volumes only has yet reached us—that relating to Public Health in Europe, mainly, we may say, at home. This home view, he informs us, he has thought it necessary to enter upon, as preliminary and in preparation for his special subject, the matter of the second volume—viz., the Hygiène of India. He says, and says justly, in explanation, after passing in rapid review the progress of sanitary reform in the West:

"It will not, we trust, be considered that the above literally 'musty' records of

Old-World barbarism have been called up without a motive. The principal object of these pages is to suggest the necessity for an active sanitary reform throughout the whole of our possessions in the East; and, at present, it is only by knowing what has yet been achieved at home, that we can adapt our measures to the mighty task before us. India is, at this moment, decidedly behind England of the fifteenth century, in respect to the sanitary condition of its towns and villages; and is, of course, in natural advantages of climate, many degrees less favourably situated as regards the probable success of hygiènic laws. Still, it has become the principle of this age to seek out difficulties for the glory of overcoming them; and the field which lies open to English scientific enterprise in the sanitary improvements of this noble country, may well engage the energies of the best intellects during the remaining half century. It may never come within the power of man to remove those infinite sources of pestilence which lie in the vast jungles and marshy plains of Bengal; still, it may be some encouragement to modern enterprise to remember that, in our own country, two hundred years ago, intermittent fevers and their allied disorders were as prevalent as they now are in Lower India, and scarcely less destructive in their ravages. In 1652, the casements of Windsor and Whitehall admitted, from the reeking flats of Eton and Lambeth, marsh vapours as poisonous as those which now arise on every side around the Anglo-Asiatic palaces of Garden Reach. If the narrow and neglected streets of old London could bring the seeds of the Great Plague into full development at a season when the fresh autumnal breezes were rushing down upon the city, laden with the scents of gardens, and harvest-fields, and pleasant waters, much more will cholera and dysentery rise paramount out of the fœtor and decomposition which everywhere prevail in Indian bazaars, during the intermission of the rains, when the sun scorches like a furnace, and the air is as still as the death which is impending. The records of the past direct us unmistakeably in the course which leads to the attainment of that most precious of the Divine gifts—long life; and energy and liberality are alone required to secure that blessing, if not for ourselves, assuredly for the fruition of those who surround us, and of those who are to follow us."

The great argument in this volume—that of a comprehensive hygiène, that of sanitary reform generally—is comprised in the best modes of encountering the removable causes of death, including of course therein the causes productive of feeble health and disease in all their varieties. After, in an introductory chapter, broadly treating of the modes of origin and the means of prevention of the causes of death which are either removable or mitigable, he proceeds, sketching the plan of his work:—

"We have seen that a large proportion of the deadliest and most prevailing diseases are the results of circumstances which it is in the power of humanity to control, and, perhaps, eventually to remove altogether; that, although the universal gift of old age can be looked for only among the blessings of the promised millennium, the power of considerably extending the term of his existence lies tangibly within the grasp of man; and that this faculty of moderating the great causes of death rests with the lawgiver rather than with the physician.

"We have now to consider," he continues, "some of the legislative measures and social rules which are obviously necessary for the diminution of the most prevalent causes of disease, and for the general prolongation of human life. The following appear to be the most requisite:—

"The encouragement of emigration from over-populated districts to healthy and productive colonies.

"The embankment of rivers, and the draining and cultivation of marsh and waste lands.

"The infliction of heavy penalties upon all persons found guilty of adulterating

any medical drug or any article of sustenance, or of vending the flesh or milk of ill-fed or diseased animals.

"Restriction in the sale of ardent spirits and of other intoxicating drinks.

"The proper building, ventilation, lighting, and draining of houses,—particularly those of the labouring population.

"The abundant supply of pure water to towns.

"The proper cleansing of all streets and thoroughfares.

"The clearing, regardless of opposition or expense, of all confined and notoriously unhealthy districts of cities, and the partition of the spaces of ground thus obtained as the sites of appropriate dwellings for the poor.

"Prohibition of intramural burial of the dead.

"The removal of all cattle-markets, slaughter-houses, piggeries, tan-yards, gas-works, &c., beyond the confines of towns.

"The erection of all extensive manufactories at the distance of at least two miles from the confines of large towns, with the provision of their being constructed in healthy situations, with proper regard to security, ventilation, warming, &c.

"Prevention of the retail sale of poisons.

"The suppression of all those trades which, while they produce no substantial benefit to the community at large, entail almost certain destruction of life or health on those who practise them; and the careful modification of all those useful trades or occupations which are attended with danger to health or risk of life.

"The due remuneration of the working-classes (especially in the manufacturing districts), and the limitation of their hours of labour.

"The opening of baths, washhouses, and places of exercise, for the use of the working classes in the vicinity of crowded cities, and in manufacturing districts.

"The establishment upon an extensive scale, throughout the country, of houses of temporary refuge for the destitute, where medical aid may be received, as well as assistance in obtaining proper employment.

"The introduction of better and more liberal rules than are at present in operation for the medical relief of the destitute sick, and for the support of incurable patients.

"The establishment of judicious systems for the reduction of the mortality in lunatic asylums, jails, and workhouses.

"The adoption of measures encouraging the poor to bring their children to be vaccinated.

"The employment of means tending to reduce the mortality among the children of the poor.

"The maintenance of a strict hygienic system among sailors and soldiers, at home and abroad.

"The enforcement of a well-conducted system of quarantine, whenever the introduction of pestilential disease is to be apprehended.

"The strict prohibition of the practice of medicine and surgery, as well as the sale and compounding of drugs, by unqualified persons.

"The gradual introduction of regulations calculated to improve the *morale* of populous districts, and to diffuse religious and useful instruction among all classes of the people."

Before separately considering each of these requirements, the author remarks:—

"Some of these provisions have long been in active, though partial operation; and their beneficial effects are daily becoming more and more strikingly apparent; others are just beginning to work, and will have to be much extended in their application before they can produce their intended and destined good; the remainder, it is to be regretted, have yet to be introduced; but the time is not distant at which the absolute necessity for their adoption must become evident to all."

On all these important matters the author gives, seriatim, much valuable and trustworthy information—such as might be expected from him. It is seldom that we find occasion to differ from him, or call in question the soundness of his views; and when we do, it is chiefly on points unsettled and open to discussion, such as the contagious nature of certain diseases, the propriety of enforcing quarantine, the extent to which it should be carried, and its efficacy—not to mention some other and minor things.

In our special notice of parts, for obvious reasons of time and space, we must restrict ourselves to one or two. We shall first select that entitled "The Employment of Means tending to Reduce the Mortality among the Children of the Poor."

We believe that it may be laid down as a principle, without exception, applicable equally to man and the brute, that the younger the animal the more helpless, the more exposed it is to noxious and destructive agents, and the more susceptible it is of their influence, and the more feeble its tenure of life. This may be one of Nature's checks against an undue increase of any one species—the weaker perishing, the stronger individuals surviving and reaching maturity to continue the race.

Be this as it may, as regards the final cause, certain it is that the preservation of infant life is very much in proportion to the judicious care that is taken of it. We have extreme examples afforded in the Foundling Hospital in its worst condition, and in a well-regulated family residing in a healthy locality in easy circumstances:—in the one, the great majority of the hapless innocents perishing in infancy; in the other, the greater number, it may be the whole, attaining the adult age.

Amongst the labouring poor, we have neither the one nor the other extreme—the ratio of infant mortality varying according to circumstances, from more than one-half of the whole registered mortality—as in the large towns, such as Manchester, Liverpool, Leeds; to less than one-third, as in the agricultural counties of Lancashire (north of Marcomb Bay), Westmoreland, Cumberland, and Northumberland. Nor is it at all surprising that there should be such differences of mortality, when we reflect on the principal causes to which it is attributable.

The following table (p. 348), extracted by the author from the 'London Medical Gazette,' November, 1846, displaying these causes, is an instructive document, as showing how, of the total 18,435 deaths at all ages in the metropolis, during one year, from the diseases specified, no less than 15,019, or 81·55 per cent., occurred in children under five years of age. It is true, the majority of the diseases given are infantile ones; yet there is one exception—viz., pneumonia, the proportional mortality from which, it will be seen, is only a degree less than from the whole, being as 71·85 to 81·55 per cent.:

Table of the principal Diseases causing Death in Children under Five Years, in the Metropolis, during 1841.

	Total deaths at all ages.			Under five years of age.	
Specific Contagion—					
Scarlatina	M. 1545 F. 1484	3029	...	M. 1126 F. 1025	2151, or 71·02 per cent.
Small-pox	M. 942 F. 862	1804	...	M. 633 F. 575	1208, or 66·96 ,,
Measles	M. 627 F. 555	1182	...	M. 586 F. 511	1097, or 92·80 ,,
Cold, or Atmospheric Influences—					
Pneumonia	M. 2149 F. 1915	4064	...	M. 1534 F. 1386	2920, or 71·85 ,,
Hooping-cough	M. 565 F. 727	1292	...	M. 534 F. 687	1221, or 94·50 ,,
Croup	M. 218 F. 193	411	...	M. 189 F. 163	352, or 85·64 ,,
Improper Feeding—					
Teething	M. 395 F. 333	728	...	M. 392 F. 333	725, or 99·58 ,,
Diarrhœa	M. 353 F. 352	705	...	M. 257 F. 242	499, or 70·78 ,,
Tabes mesenterica	M. 261 F. 201	462	...	M. 229 F. 178	407 or 88·09 ,,
After the above, or in consequence of other Diseases—					
Thrush	M. 129 F. 130	259	...	M. 127 F. 129	256, or 98·84 ,,
Convulsions	M. 1545 F. 1191	2736	...	M. 1512 F. 1146	2658, or 87·11 ,,
Hydrocephalus	M. 982 F. 781	1763	...	M. 865 F. 660	1525, or 86·48 ,,
Total		18,435			15,019, or 81·55 per cent.

The author refers to the following heads the chief destructive avoidable causes of disease and death in infancy and childhood:

"1. The crowding and injudicious management of infants in foundling hospitals and orphanages.
"2. Neglect on the part of parents.
"3. The systematic administration of narcotics.
"4. The confinement of children in ill-ventilated school-rooms."

The facts which he has brought forward on these several points may most of them be familiar to our professional readers; they are of a very striking kind, and admirably adapted to make an impression on the public, and to rouse to exertion all who have it in their power to check the evils. Some of the instances he adduces are almost of a kind to come under the consideration of the medical jurist, such as the fatal practice of drugging infants with laudanum, sold under the cant term of "quietness," and the nefarious tempting premium to the neglect of offspring, if not of their wilful murder, by having them in burial clubs; or the infamous practice of druggists administering to the destruction of infant life by the unstinted sale of the deadly drops. The author raises an indignant voice in reprobation, urging that there should be severe penalties on those

"Who render themselves accessories to systematic and wholesale murder by the sale of pennyworths of 'venomous distilment' to ignorant and inexperienced wretches who, in nine hundred and ninety-nine cases out of a thousand, have not the slightest conception that in thus drugging they have called *Death* to stand and watch beside the crib."

Let us pass to another and very different class—soldiers and sailors, those employed on active service—ranging in age from eighteen on an average to thirty-six (few of them are older), all of them chosen men—and who may, in consequence, as regards power of endurance, power of resisting noxious agents productive of disease and death, be considered as ranking highest in degree, as much so as infants must be admitted to rank lowest. Should it not follow, then, that were just sanitary rules observed in our armies and navies, the health of the men in each service, as marked by disease and death, ought to exceed that of the people generally including all ages? Now, what are the facts? In the instance of the home-station, it would appear that amongst our troops the mortality has never been lower than that of the mixed population of our healthiest districts (about 14 per 1000); whilst in some regiments, as the Foot Guards, it has been considerably higher, as much as 21·6 per 1000; and taking our foreign stations, it has ranged from 15·5 in the healthiest, as the Cape of Good Hope, to 483 in the least healthy, as in Sierra Leone, "the white man's grave." Statistics might be given to a great extent, and of a reliable kind, in proof of the unhealthiness of our troops, and their losses from sickness at different periods and in various climates, vastly exceeding the greatest sustained in action from the fire of the enemy; and the same remark applies to our navy. It is as well proved that the more attention has been given to their sanitary condition, the better has been their health, the greater their efficiency, and the less their mortality. The royal navy, as a whole, is a striking example of the good resulting from judicious sanitary measures. There was a time when our fleets were more than decimated by scurvy and crippled by disease; now, scurvy is almost banished from the navy; now, on the healthiest stations the mortality amongst the seamen is reduced below that of the mixed population at home. It also affords notable examples in particular instances, and even at present, of the direful effects of negligence of sanitary laws, such as are afforded by the outbreak of destructive fevers in ships, the holds and bilges of which have been allowed to become foul. Our army too, as a whole, and in particular instances, affords equally good examples of the benefit derived from attention to sanitary measures, and of the evils following their neglect. In the West India command and in Jamaica the mortality at one time varied from 80 to 250 per 1000; of late years it has seldom reached 80, and has been more commonly as low as 40: a change not connected with any alteration of climate, but with improvements in the men's barracks, less crowding, better ventilation; improvements in their diet, diminution of salt rations—still affording scope for improvement—and in other matters bearing on health. In the Crimea—to take the latest instance of the extremes—whilst in the winter of 1854 our troops before Sebastopol sustained, it is reported, from sickness the enormous loss of 350 per 1000 in a few months, the crews of the ships anchored off the same shore, and employed on the same service, retained their ordinary good health,

and experienced no increase of mortality. In brief, both services may be viewed as experiments made on the grandest scale, as if for the express purpose of testing the human constitution in various climates and under various circumstances, and of illustrating the principles of Hygiène. The experience obtained has been dearly purchased; but what is most to be regretted is, that it has so often been neglected or turned to so little account. Were not the destitute state of our army in the Crimea so well authenticated during the terrible winter alluded to, it could not be credited. Could it be believed that with a noble fleet of men-of-war and steam transports at hand, with the capital of the Turkish empire within two days' sail, with productive countries not more remote capable of furnishing cattle, corn, forage, fuel, and wood for hutting, a small force not exceeding 35,000 of all arms should have almost perished from want of wholesome food, shelter, and clothing! Even though so well authenticated, it is hardly credible! Is it not a most demonstrative proof of the want of sound knowledge of what constitutes the science of Hygiène on the part of the authorities who conducted the war, both in the Cabinet and in the field; and also of the little influence exercised by the medical department of the army in its special function, that of attending to and preserving the health of the troops under its care? Let us hope that the disasters before Sebastopol from negligence of sanitary laws and measures, will be a warning for the future, and lead both to a more efficient organization of the medical department in all its branches, and to the securing it more influence in an administrative capacity; for what is the use of knowledge without authority and the means of making it practical? We have no hesitation in expressing our opinion, founded on pretty wide experience, that were sanitary provisions carried out as they might be under ordinary circumstances, and as far as possible under circumstances of difficulty such as are likely to occur in any campaign, a vast saving of human life might be effected, especially in our colonies and at home, with increased efficiency and contentment, with less malingering, desertion, and suicide—chiefly by the selection of healthier quarters, by the adoption of a more varied and wholesome diet, and the use of more suitable clothing. Space does not permit us to enter into details. Many of the particulars we could relate in illustration would hardly come short of those which have been so perfectly authenticated as having occurred in the Crimea. But in reflecting on our own experience, we are forgetting our author. That part of his work relating to "The maintenance of a strict hygiènic system among sailors and soldiers at home and abroad," will well repay perusal; it furnishes ample facts demonstrative of the evils of neglect of a sanitary system, whether in the army, or navy, or the merchant service, and of the marvellous and blessed effects following its trustful and careful adoption. Regretting that we must pass over unnoticed so much that is valuable and impressive in this work, and indulging the hope that we shall soon see the second volume, we shall finish with one more extract—his concluding paragraph—in all the aspirations expressed in which we heartily join him:

"It is trusted that enough has now been said to prove that, mortal and transitory as the condition of man inevitably is, he has been endowed with a power of lengthening as well as of improving his earthly existence; that this remarkable

power has hitherto been cast aside with a strange and wilful carelessness; and that the means by which it may be exercised, although but very imperfectly developed at present, are beginning to assume the form of a great and beautiful science. Let all who possess the benefits of intellect and education—the divine in his study and in the house of prayer, the general in his camp, the legislator and the magistrate in their constant ordering of the people, and the physician in his daily converse with scenes of every kind and intercourse with men of every class—let each to the fullest measure of his ability join earnestly in the development of this inestimable science—

> 'Still educing good,
> And better still, and better thence again,
> In infinite progression,'

and we may venture to predict that the end of this century will find the civilized nations of the world twice as happy—nay, it may be, twice as virtuous—as they were at the opening of its sixth decade!"

Review VI.

Mémoires de l'Académie Impériale de Médecine. Tome XIX. *Paris,* 1855. 4to.

The preliminary pages of this volume are occupied with—1. Éloges of Désormeaux, Capuron, Déneux, and Baudelocque, from the pen of the Secretary, M. F. Dubois, who, in this species of composition, bids fair to rival the successful Pariset; 2. A Report on the Prizes adjudged by the Academy, by M. Gibert; and 3. A Report, by M. Gaultier de Claubry, upon the Epidemics which prevailed in France during 1853. These we pass over, and proceed to the memoirs contained in the volume; the first calling for notice is

I. *On the Obliteration of the Umbilical Arteries, and on Umbilical Arteritis.* By M. Notta.

M. Notta first alludes to his former researches* upon the obliteration of arteries after ligature. From these he concluded that the portion of the artery comprised between the ligature and the first collateral does not become transformed into a fibrous cord, but only undergoes an atrophy that still allows the various elements of its structure to be recognised. A persistent coagulum fills this space of the artery, but undergoes no transformation. To this statement, the fibrous transformation of the umbilical arteries was objected, and the present paper is devoted to considering the validity of such objection.

In the first place, the results of M. Robin's researches upon the *structure* of the umbilical artery are brought forward. According to these, the middle tunic is almost exclusively composed of the muscular fibres of organic life, while, in place of obtaining its blood by imbibition, as in the case of other arteries, it is probably vascular; for, although it has never been injected, it is very prone to inflammation, which is followed by the same results as are seen in vascular parts. Under the ligature, however, this coat is divided exactly as in other arteries.

Examined within the first three days after birth, the umbilical arteries

* Gazette Médicale, 1850.

may be found completely devoid of coagula, or, if these exist, they are of variable length, soft, and only slightly adherent. The walls of the artery, by reason of their great contractility, may be in contact, but they are easily separated by means of a probe. Near the umbilicus the arteries are almost always tumefied to double or triple their volume. From the eleventh to the twenty-first day a fine probe can still be introduced by the hypogastric. The parietes are brought into contact, so as to prevent the access of blood, but they are not adherent, the lining membrane retaining all its smoothness and polish. The arteries participating in the development of the parietes of the abdomen are somewhat larger than at birth, but they exhibit no thickening or hypertrophy in their course, beyond the tumefaction near the umbilicus. As to the clot, when it exists, it is now adherent, dense, and reddish; but, later, gradually disappears, so that not a trace of it remains when the fibrous transformation is completed. Although farther observation is required, it is certain that a longer period is required to effect this obliteration than is usually supposed, since M. E. Dubois has found it unaffected in six or seven weeks. The inconstancy of the formation of the clot, and its variable extent, are due to the variable amount of blood that continues to pass, proportionate to the greater or less amount of contractility of the middle coat.

As already stated, about the third day the umbilical arteries present a dilatation near the umbilicus, which is obviously connected with the fall of the funis. There is always, in fact, a certain amount of inflammation attendant upon this fall, although it does not always induce suppuration. This inflammation invades the umbilical arteries to a certain extent, and according to the intensity of the phlegmasia, the tumefaction is more or less considerable. It is always confined to the vicinity of the umbilicus, the conditions being pathological under which it extends to two or three centimètres beyond; while M. Notta has never found it implicating the entire length of the arteries. M. Notta thus sums up these various changes:

"Thus, a less considerable quantity of blood in the umbilical artery, contraction of the artery throughout its entire extent, formation of a coagulum (which, however, is not essential, the contraction of the artery sufficing in a great number of cases for the obliteration of its calibre), inflammatory tumefaction of the walls of the artery at the umbilicus only, then resorption of the coagulum when this exists, and the ulterior transformation of the parietes into a fibrous cord, which participates in the development of the abdomen; these are the various phases through which the umbilical arteries pass. It is evident how much these differ from the mode of the obliteration of arteries after ligature, such as I have observed it, and as I will recapitulate it to facilitate comparison. Immediately after the ligature, the column of blood continues to fill the vessel (which does not contract) to its extremity. A coagulum is formed, and fills the artery as far as the first collateral, whatever be its size, providing it be permeable. The clot and the portion of the artery enclosing it persist, and are never transformed into a fibrous cord." (p. 7.)

The inflammatory tumefaction of the arteries near the umbilicus, which may, from its intimate connexion with the fall of the funis, be termed physiological, is not always restrained by these limits, but may increase in intensity, so as to give rise to suppuration of the arterial walls and its consequences. So little attention has been excited by *umbilical arteritis*,

that there are few cases on record, although the affection cannot be so rare, as the author has himself been enabled to deposit five examples of it in the Dupuytren Museum,* the particulars of which he now furnishes. In four of these the funis had become detached, and in the other it still adhered; and in all there was pus in the umbilical depression. In two cases the umbilicus was surrounded by a rose-coloured areola, but it was never much tumefied. In all the cases, the arteries near the umbilicus presented the characters of violent phlegmasia, the middle coat, contrary to what takes places in other arteries, actively participating in this. In all, the pus was separated on the side of the hypogastric artery by a small, adherent, fibrinous clot, that varied from two to fifteen millimètres in length, but never reached to the hypogastric artery. In two of the cases, the cavity of the peritoneum contained serosity, and the portion covering the arteries was injected. In two other cases, there was no peritoneal injection; and nothing besides the tumefaction could give rise to the suspicion of the arterial lesion, which would certainly have been overlooked had not attention been already directed to the subject. In all these cases the umbilical veins were healthy. Nevertheless, in thirteen cases of umbilical phlebitis, the author has found accounts in three of them of a coexisting arteritis.

In regard to the question whether umbilical arteritis is always fatal, it is to be observed, that in the author's cases this constituted the principal lesion, so that we may conclude that it alone may induce death, especially when the phlegmasia invades the peritoneum. Still, as a diagnosis of the disease has never been made during life, we cannot state that it has never been cured. It is even probable that the prolonged umbilical suppurations which terminate in recovery, are sometimes due to an arteritis of small extent. However this may be, it is a most dangerous affection, both from the vicinity to the peritoneum, and because it may become the point of departure of infantile erysipelas, the seat of which is always near the navel.

The diagnosis is difficult, for often there is nothing externally that reveals the arterial inflammation. In two of the cases only was there a little redness around the navel; nothing existing in the others beyond a little pus at the bottom of the umbilicus, which being covered with a dry crust, might escape careless examination. The treatment should be especially preventive, avoiding all friction of the umbilicus by hard napkins, observing the strictest cleanliness, and washing away, by marsh-mallow lotions, any pus that may remain beneath the crust which succeeds the fall of the funis. In this way we may moderate any inflammation that exists, and prevent its propagation to the arteries. If a collection of pus is recognised, we should open it sufficiently to allow of free issue.

II. *Case of Successful Ligature of the Arteria Innominata.* By M. Peixoto.

Among several interesting "Cases in Surgery" communicated by M. Peixoto to the Academy, we select this one for transcription. M. Moura,

* Dr. Schöller has met with inflammation of the umbilical arteries in 15 out of 18 cases of trismus neonatorum. Dr. Collis, of Dublin, also attributes this affection to umbilical arteritis. See Jones and Sieveking's Manual of Pathological Anatomy, p. 345.—Ed.

a distinguished Portuguese doctor of medicine, aged thirty-three, was the subject of it. An erectile tumour of the right ear began to develop itself in 1832, and in 1845, M. Nélaton tied the posterior auricular, considerable hæmorrhage following the fall of the ligature. After temporary amendment, the tumour again made great progress, and frequently gave rise to serious hæmorrhage; the patient being then at Rio Janeiro, M. Peixoto tied the common carotid in the middle of its course, 14th November, 1851, and on the 27th, surrounded the tumour itself by a ligature, which induced its separation by sloughing. On the 4th December, some bleeding was observed where the carotid had been tied, the ligature not having yet come away; and as the hæmorrhage recurred again, it was resolved to apply a precautionary ligature (*d'attente*) lower down. On the 8th, this was executed on the trunk of the innominata; and in a later communication to the Academy, the author states the cure was completed in two months.

M. Velpeau, reporting upon this case,* observes, that as far as he is aware, this is the first example of a cure resulting from the artificial obliteration of this artery; although the cases of accidental occlusion published by Pelletan, Martin-Solon, and Barrach had already shown that its occlusion did not deprive either the arm or the brain of a sufficient supply of blood. The cases of operation have hitherto all terminated fatally. Mott, who first practised the operation in 1818, lost his patient on the twenty-sixth day. Gräfe's patient died on the sixty-eighth day, Bland's on the eighteenth, and Hall's on the sixth. In Lizars' case, death occurred at the end of three weeks. After M. Kühl's operation, in which the ligature comprised the subclavian and the carotid close to the innominata, death took place on the third day. A patient of M. Arendt's died on the eighth day; and two operations performed by M. Bujalski were followed by death in two or three days. Finally, M. Hutin lost his patient on the eighth day. So that ten operations have furnished as many deaths.

After all, M. Velpeau adds, this is not an example of ligature of the innominata, properly so called; for although a ligature (*d'attente*) was applied to and flattened the vessel, this was not tightened. The patient was cured, but nothing allows us to affirm that the ligature bore rather upon the common trunk than upon the origin of the carotid alone. Nor is there anything that absolutely proves the closure of the innominata, if closed it be, not to have taken place as a consequence of the first ligature, rather than under the mere influence of a ligature *d'attente*.

III. *Reduction of a Complete Inversion of the Uterus at the end of Fifteen Months.* By M. Barrier.

Marie Michaud, a scrofulous subject, aged twenty-four, was confined, after a natural labour of ten or twelve hours' duration, 14th September, 1851. The removal of the placenta was accompanied by traction, and followed by hæmorrhage, and three days afterwards a large tumour protruded externally, which, however, was returned within the vagina. From that time severe hæmorrhage had recurred every few days, which much

* Bull. de l'Acad., tom. xix.

exhausted her strength. She entered the Hôtel-Dieu at Lyons, of which M. Barrier is surgeon, 13th February, 1852. A tumour was found just within the vagina, consisting of the completely inverted uterus, somewhat larger than normal. Tonics were administered to her, and on the 9th March, reduction attempted. This was easily effected, under etherization, and with little loss of blood. A bladder of vulcanized caoutchouc was introduced into the vagina, and insufflated, removing it morning and evening, in order to inject the vagina, and discontinuing it after the 11th. The patient continued to improve, was enabled to walk about a little by the beginning of April, by the 15th of which month she was considered as cured.

We can only give the title of the next paper, which is—

IV. *A Critical Examination of the Efficacy of Emollients.* By Dr. Delioux;

And pass on to—

V. *The Pathological Anatomy of the various Forms of Goître, and the Treatment suitable for them.* By M. Bach.

This memoir forms a portion of M. Bach's essay, that recently obtained the Academy prize. He prefixes to it an account of the normal histological characters of the thyroid gland; but as he adds nothing to what is already known, we shall merely give a summary of the author's description of the varieties presented by the affection. He establishes three principal forms, accordingly as the vascular, glandular, or connective tissues are the seat of the hypertrophy which constitutes the essential feature of the disease.

1. *Vascular Goître.*

(1) *Congestion.*—The thyroid, owing to its abundant supply of large vessels distributed in lax cellular tissue, is perhaps the organ, next to the spleen, most liable to considerable changes of size from congestion. As, however, this is rarely fatal, there have been few opportunities of observing its anatomy. M. Bach has met with two. The one occurred in a fœtus delivered by the forceps, and the thyroid was found dark and resistent, like a piece of apoplectic lung. The vessels were gorged with blood. The other thyroid was taken from a woman who died in puerperal convulsions. It had the same appearance, and was reduced to about half the volume, when incisions had evacuated abundance of blood. The gland was only gorged, for no coagula were found in its substance. After long maceration, its texture was found quite normal. Instances of great turgescence of the gland are often observed during life, and M. Bach alludes to one such occurring in a child born with the forceps, who presented an enormous goître, which felt rather hard. Next day it had diminished one-half, and in four days had disappeared. About puberty, turgescence is frequent; and if menstruation is ill-developed, it may become permanent. In young persons, masturbation is a frequent cause of such congestion.

(2) *Thyroidean Apoplexy.*—Sometimes excessive turgescence or ulceration may give rise to rupture of a vessel, and then effusion of blood takes place. In two thyroids, M. Bach has found a coagulum of blood enclosed in a kind of cellular pouch. In one, this pouch had become very

dense, and almost identified with the coagulum, which was about the size of a walnut. No trace of vessels could be discovered in the coagulum, and the capsules of the gland in its immediate vicinity seemed destroyed; while at some points they were deformed and heaped together, presenting a fibrous appearance. In both cases, the gland was well developed, without being hypertrophied, and the arteries were not ossified. The coagulum undergoes the same changes as in other apoplexies, and may lay the foundation to one form of cystic goître." In place of this, however, a cicatricial tissue may be produced, which may extend in different directions, destroying the glandular capsules. The vessels of these capsules and the finer capillaries become atrophied, so that goîtres of this kind are the least vascular, and, though small in size, extremely hard, owing to the retractile power exerted by the cicatricial tissue. The cicatrix, by continuity of tissue with the envelope of the gland, may exert a certain retractile effect upon that membrane, which may injuriously compress the larynx and trachea. Two examples are given in which such compression gave rise to serious symptoms. In this cicatricial tissue, calcareous deposit easily occurs.

(3) *True Aneurismal Goître* has been noticed by Walther and others, but only incompletely described. A case has never occurred to M. Bach; and he suspects that some of those described and treated as aneurismal have been really examples of permanent congestion with great arterial activity, and capable of relief by other means than operation.

(4) *Vascular Parenchymatous Goître.*—In this form, the description of which the author for the most part borrows from Ecker, certain metamorphoses occur under the influence of hyperæmia, affecting at first only small portions of a lobe, but eventually involving the whole gland. The part affected becomes isolated from the sound parts by condensed cellular tissue, so that the degenerated lobules may be easily enucleated. When seen at an early stage of the change, the lobule is of a deep red colour, the granular appearance having almost disappeared at the surface of the section. In certain parts, Ecker found the glandular capsules in a state of integrity; vessels somewhat dilated and gorged with blood, ramifying in the compact tissue, separating these. Towards the centre, the vessels had undergone more dilatation, the surrounding tissue had become denser, and the capsules had well-nigh disappeared. The dilatations of the minute vessels assume an ampullar form, of varying diameter; on opening these ampullæ, which offer a considerable resistance to pressure, amidst globules that are in a normal state, others, altered in form and deprived of colour, are observed, strongly adherent to each other. Another change that takes place as a consequence of this altered condition of the capillary system is, the calcareous incrustation of the minutest vessels, these being much smaller than those undergoing the ampullar dilatation. Still, the latter vessels are also sometimes the seat of incrustation also. These incrustations are to be distinguished from those met with in cystic or other forms of goître, and which have another origin.

2. *Parenchymatous Glandular or Lymphatic Goître.*

This is due to hypertrophy of the substance of the gland itself, or, to speak more exactly, to the abnormal development of the glandular

capsules distended by a fluid of a gelatinous consistency. It is not secondary to vascular goître, already described, but may coexist with it. After describing the views held by Beck and Ecker upon this transformation, Dr. Bach gives the result of his own observations. He found

"Agglomerations of normal capsules, some capsules filled with blood, and lastly, capsules of half a millimètre in diameter filled with fluid. These larger capsules present an anhistous envelope, containing a smaller plaited one, and separated from the first by a hyaline fluid, and a little punctuated mass. The inner capsule is formed of cells like those constituting the normal contents of the capsules, almost all having a nucleus, some containing one or two young cells, and all containing granules analogous to those of the surrounding gelatinous mass. The centre of the capsule appears hollow, and contains young capsules, which themselves enclose less compact cells, not forming a complete epithelial layer, and destitute of nuclei.

"These corollaries result from my researches. Capsules of half a millimètre in diameter are already diseased. Gelatinous substance enters the capsules by endosmosis, and distends the anhistous membrane. The epithelial covering, formed of the characteristic cells, shrivels up, and is repelled towards the centre. The gelatinous matter is also introduced into the internal cyst, but without distending it. The inner cyst is larger than a normal capsule, and may become the seat of new capsules. The young capsules are formed of cells by endogenous generation, and are clothed later by an anhistous membrane. The young cells of the young cysts only acquire nuclei at a later period. In portions of these thyroids, cells are observed, and the capsules are wanting, and in other portions more degenerated there is only a punctuated mass representing the *débris* of cells. These researches prove the accuracy of the observations of Rokitansky; and, with that author, I admit that the thyroid gland is endowed with great power of production. It would seem probable, from the researches of Beck, Ecker, Rokitansky, and myself, that the change in the capsule does not always occur in the same manner, but the production of gelatinous matter in the primary glandular capsule, is always the definitive result." (p. 368.)

It is this glandular parenchymatous goître that is oftenest found endemic, manifesting itself soon after birth, and increasing with the individual. The *goître of new-born children* has been but little observed. The subjects are plump and well-looking, and the neck seems merely somewhat large, or the seat of an accumulation of fat. Obstruction of respiration, which in a few hours may lead to death, may, however, occur. The inspirations are long and deep, and are accompanied by a peculiar plaintive tone, that is heard at a considerable distance. Cries indicative of suffering attend expiration. In bad cases the child is unable, owing to the dyspnœa caused, either to drink or suck. It struggles with the difficulty of respiration, and at last perhaps perishes almost unexpectedly. In a case witnessed by the author, one of the most remarkable circumstances was the excretion of an enormous quantity of bronchial foam, resembling that observed after division of the pneumogastric nerve in experiments, and he supposes the external part of the gland induced irritation in that nerve. The author does not agree with Betz, that there is no alteration observed in the gland in these cases. He found the glandular capsules increased to 0·150 or 160 millimètres, in place of 0 075 millimètres, the extreme normal limit, while great hyperæmia was also present. He believes that some cases of thymic asthma are really due to a posterior development of the thyroid. In very urgent cases no treatment is of avail, but in milder ones, leeching and iodine ointment may be resorted to.

3. *Metamorphoses which the Stroma and Cellular Tissue of the Thyroid undergo.*

The stroma of this gland is a fibro-cellular tissue, in which ramifies a rich network of bloodvessels. The newly-formed tissue most frequently met with is the fibrous, the product of an amorphous blastema due to the stasis of the blood in the vessels, to its extravasation, or to its exudation through the capillary tissue; and its primordial texture is the same as that of normal fibrin. One of the characters of accidental fibrous tissue is its retractility, as already observed when treating of apoplectic goîtres; and it may undergo the fatty, osseous, and cretaceous transformation. So also, air may be effused amidst the cellular tissue: and new products may be there developed which are not met with in the healthy economy.

(1) *Cellular Goître.*—A species of goître is not infrequently met with that takes on a rapid and very large development, and has been well described by Heidenreich. Its progress is too rapid to be due to the development of the gland capsules, and remedies suitable for glandular goître fail here. M. Bach has carefully examined such a goître, as it occurred in a man aged sixty. He found cells of an irregular shape, rather angular than rounded, some of them intercommunicating. Their walls were thickish, and sometimes contained cartilaginous or osseous matter. The fluids in the cells were sometimes serous, and at others gelatinous or bloody. The glandular element was not to be recognised; and although the capsules were in some points unaltered, they were separated by layers of degenerated cellular tissue. The arteries could not be injected, and the venous plexuses were much dilated. The microscope showed the walls of the cells to consist of fibrous tissue of new formation, composed of bundles of homogeneous fibres. Between these were scattered here and there some granules, fusiform cells, and muscular fibres of organic life. In other portions the elements of cellular tissue, together with some fibres, were observed.

(2) *Emphysematous Goître.*—This form has been described by Larrey under the name of *aërien;* it is due to no primary change in the thyroid gland, but is produced by a fissure or rupture taking place in some portion of the air-tube. Sometimes, however, the air penetrates into the tissue of the gland, and induces alterations due to inflammation and changes in the glandular capsules.

(3) *Scirrhus and Encephaloid of the Thyroid.*—This is so rare that M. Bach is unable to refer to any well-authenticated recorded example; the disease so termed by Larrey, being really a *ramollissement* of lymphatic glands. So, too, there is no example of *tubercle* of the gland on record, and the few instances of *hydatids* may have been really examples of capsular cysts.

(4) *Cystic Goître.*—This name is given to a tumour formed by a cyst developed in the midst of the normal elements of the thyroid gland, and containing a more or less liquid or sometimes solid product of new formation. This was at one time termed *false goître*, but it is as properly goître as is the parenchymatous form. It may originate in various modes, as from a pathological blastema, the product of inflammation, the

metamorphosis of an apoplectic clot, or the degeneration of one or more glandular capsules. To these primary transformations others succeed secondarily.

Whatever be the origin of the cyst, its walls consist of a layer of cellular tissue, amidst which fibres are deposited. Vessels are developed within the walls, most of these being of new formation; and all the internal surface of the cyst is lined with epithelium. In some rare cases, the walls are so thin as to be nearly transparent; but they are usually thick, and especially in front. Posteriorly, however, they are generally as thin as paper, and the vessels when distended project into the cavity containing the fluid. This liquid forms a support to the vessels, and rupture of their walls, with hæmorrhage, may be the result of evacuating it. These projecting vessels are easily ruptured by pressure with a blunt body, explaining one of the causes of the hæmorrhages that are so frequent in operations on these parts. The walls not infrequently undergo cartilaginous transformation, which has been called *enchondroma*, and which consists in varying proportions of hyaline tissue and cartilaginous fibres. After more or less time, this has a tendency to pass into *osseous* tissue, years, however, being required before the entire cyst is so metamorphosed.

The cyst encloses either serosity or colloid matter. The first proceeds from the serum of effused blood that has not been taken up by the absorbents, and its quantity is increased by endosmosis from the afflux of blood which takes place towards the cyst. It contains no fibrin, and is incapable of organization. It is sometimes absorbed. Inflammation may sometimes induce such absorption, or it may convert the internal wall into a pyogenic membrane. Frequently, in proportion as the serosity disappears, it is replaced by products of new formation—such as crystals of cholesterine or the salts of lime, these being deposited in mass, or in the walls of the sac; the *colloid* matter is a colourless or yellowish gelatinous mass, of the chemical composition of which different accounts are given. It is, however, amorphous, and does not contain cells, those met with being detached from the epithelium.

Treatment.—We do not find much of novelty in the author's directions for the preventive and medical treatment. He thinks, as a general rule, practitioners too eagerly resort to specific remedies, without previously attempting to subdue by bloodletting the congestion upon which the affection so often depends. Of the use of *iodine* he expresses himself as follows:—

"It is not suited to congestive or any of the varieties of vascular goître, and should not be resorted to until all congestion and vascular action have been subdued, supposing the antiphlogistic treatment has not triumphed over the disease. It will then prove of use, because our object is to destroy either a product of exudation, or a commencement of the transformation of the capsules into colloid matter. We must not rely upon it in certain encysted goîtres. It will not cause the disappearance of a voluminous cystic goître containing colloid matter, nor exert any action upon those containing serosity. No advantage will be derived from it when the cysts have undergone tertiary transformations. It will partially disperse the parenchymatous cystic goître, on condition that this is principally due to the degeneration of the capsules, and that the vascular element does not predominate. Iodine will almost always triumph over parenchymatous

goître, however large this may be, and especially where the capsules have not taken on excessive development. It exerts no action upon cellular goître, or in that accompanied by carcinomatous or other morbid products." (p. 417.)

With respect to the *surgical treatment*, as this is often attended with considerable danger, M. Bach lays down the rule that it should never be had recourse to except when the patient is much inconvenienced by the disease, and his life is or may soon be placed in danger. Of the various operations, *puncture* is only to be practised when suppuration exists, or as a means of emptying a cyst prior to its injection. Not infrequently, after evacuating the fluid, a distended artery may give way, and rapidly fill the cyst with blood, the tumour afterwards enlarging more than ever. Of all the *injections*, iodine is the only one that should be employed, and this not only from its greater innocuity, but from the specific influence it may exert. Even with this, inflammation and suppuration of the cyst are sometimes induced. It is often, too, very difficult to detect fluctuation, and when it is evident, we cannot decide whether the cyst be unilocular or multilocular. If the glandular capsules are very dilated, they may also give rise to fluctuation, when puncture discharges very little fluid, and the goître subsides only incompletely. The *seton* is unsuited for the vascular, the glandular, the parenchymatous cystic, or in voluminous cystic with thickened walls. It should be reserved for cystic goître of moderate size, and presumably thin walls. The double suture, impregnated with chloride of zinc, and passed at right angles, is the best form. *Incision* should be confined to cystic tumours of large size, puncture and injection being preferable when the walls are thin. As with the seton, the danger of hæmorrhage or inflammation is considerable. *Cauterization*, though discountenanced by most surgeons, the author has seen advantageously employed in M. Bonnet's mode in voluminous cysts containing concretions; but its effects are mischievous when it is applied to tumours not containing fluid. The *ligature of the superior thyroid arteries* alone, in the author's opinion, is of little avail, while the difficulty of securing the whole of them must ever render the operation quite exceptional. On the total or partial *excision* of the thyroid, M. Bach adds nothing to our present information, but he states that his own success in the operation of extirpation by *ligature en masse*, has caused him to feel surprised at the little favour surgeons have shown to it. Certain goîtres are not amenable to it, as those of immense size, cellular goître without defined limits, and goître closely adherent to the larynx or trachea; but as great numbers of goîtres are not found in these conditions, in the majority of cases the ligature is applicable. The nature of the tumour is never a contra-indication, although the operation is better suited to some forms than others. The absence of pedicle is not the objection it is supposed by some to be, the author having applied the ligature around a portion of the gland five or six centimètres in diameter, without any ill effects. The constriction must be made very gradually, or dyspnœa or nervous irritation may result; and it is not until twenty-four or thirty hours that the complete arrest of the circulation in the tumour should be effected. After the fourth day, the constriction should be temporarily discontinued, for at this time there is a tendency to consolidation of the exudation. Three days later, the ligature is again tightened, so as to slowly induce the gangrene of the part embraced.

VI. *The Pathological Anatomy of the Cicatrices of the Various Tissues.* By Dr. F. Hutin.

In this prize essay, the subject of the reunion of divided parts is pursued in detail through the various tissues, but the only portion we deem it desirable to lay before our readers is that treating of the *Pathological Affections of Cicatrices*, a subject which the author's position, as surgeon to the *Invalides*, has given him ample opportunity of studying.

In general, small cicatrices are not painful, although they are sometimes the seat of pruritus, and a troublesome sense of dryness, for which no causes can be assigned beyond the absence of local transpiration, and the imperfection of their structure. The subjects of large and deep-seated cicatrices, however, are very liable to severe pains proceeding from the inodular texture itself, or from the neighbouring tissues, and produced by the changed relations of parts, new adhesions, injury to nerves, &c. Severe lancinating pains seem to be due to certain filaments of nerves which run contiguous to the inodular substance, or terminating with more or less swelling near its circumference. The pains are always aggravated in wet and stormy weather, and the patients complain of a sensation as if the cicatrices were tense or swollen; but the most careful measurement detects no difference. These sensations disappear if we cover the cicatrix with wadding or other warm substance, while they persist if we cover the surrounding parts and leave the cicatrix exposed. When adherent cicatrices are situated over very moveable parts, the movements induce tractions that are very painful; and if there be osseous inequalities beneath, ulceration or laceration of the cicatrix may occur.

Cicatrices may easily become the seat of inflammation, and an erythema may readily pass into ulceration; while, if the inflammation be severe, gangrene may result. After a certain period, only rare capillary vessels ramify through the inodular tissue, the vessels which traversed it at the time of its formation having become converted into fibrous cords, so that the finest injection does not penetrate. This operates as some protection against inflammation. We find varicose veins ramifying in extensive cicatrices, although, for the most part, they are seated beneath the cicatricial tissue, through which they are visible. Œdema sometimes raises cicatrices as it does the rest of the skin, although less easily when there are adhesions. Ecchymosis is also met with, but rarely without excoriation. Cicatrices may be the seat of hypertrophy, and M. Hutin gives an account of the dissection of one, resulting from an abscess in the thigh, which had been submitted to pressure during the occupation of a shoemaker. It was a simple hypertrophy, in which the surrounding skin did not participate, the cicatrix being triple its proper thickness, projecting a centimètre above the level of the skin. Hypertrophy of the neighbouring skin, as in elephantiasis, may sometimes extend to the cicatrices, but in other instances does not do so.

Sometimes cicatrices become covered with small conical or nipple-like elevations, which in consistence and colour much resemble corns, and, in certain cases, large, hard, and lamellated, present some analogy to horns of the skin. They are, however, but the result of dirtiness and

prolonged pressure, occurring especially in cicatrices possessed of depressions and furrows, in which epidermis, dust, and other bodies accumulate and become adherent to the skin through the agency of its transpiration. The projections are not implanted in the cicatrix, but adhere to it, and fall off at various periods, from some weeks to a year. Cleanliness is the remedy. In other persons, however, really adherent eminences are seen, and are true excrescences from the cicatricial tissue, or they may arise from the surrounding normal parts. Indeed, it is very rare to meet them on the cicatrix, without any participation of the skin. Sometimes, again, cicatrices serve for the implantation of horny substances of various forms, which sometimes acquire a large size. Two examples are given by M. Hutin, in one of which the horn, of a spiral form, was ten centimètres in length; and in the other, reached a length of five centimètres, with a base of three. Usually, however, these horn-like substances are of much less size, always being hard at their free extremity, and becoming softer as they approach the point of implantation. The especial seat of those of a small size seems to be the extremity of the stump after amputation, and chiefly amputation of the thigh—the cicatrix in these cases being subjected to much and constant pressure.

The author has twice met with the *warty* affection of cicatrices described by Hawkins. In the first case, the growth was the size of a small nut, and resembled the warts observed on the fingers. The other more resembled fungus hæmatodes, and grew from a portion of the cicatrix of a large ulcer of the leg; seeming, however, more intimately united to the surrounding skin than to this. The author only made a transient examination of this growth; but he suggests that both it and the examples described by Hawkins may be varieties of cancer. The latter and other malignant diseases sometimes attack the cicatrix, and especially when this is large, and situated on the lower extremity. The most curious and rare accidental production M. Hutin has met with, was a kind of *keloid*, in the person of a soldier, who, at the age of twenty-six, received (November, 1839) many blows with a yatagan on various parts of his body, one of these striking the left ear, and another the point of the left shoulder. While reparation of the last two wounds which resulted was going on, vegetations sprang from the bottom, which were mistaken for ordinary granulations, and were kept down by nitrate of silver. In forty days the wounds were quite closed, but the vegetations, covered with epidermis, continued to make progress, and after a while they became so large and troublesome, that M. Gimelle removed those of the shoulder in 1842. Those of the submastoidean region were removed in 1843. These excrescences were reproduced with the same activity in the new cicatrices, while nothing of the sort was observed in those of the thirteen other wounds. The excrescences still remain, although somewhat diminished in size, the result of the operations of Nature, after the failure of every application. *Cysts* of various kinds not infrequently are developed on cicatrices, but they are rather formed at the expense of persistent or neighbouring sebaceous follicles, than of the inodular substance itself. In old cicatrices, especially when large, *cartilaginous and osseous deposits* may occur. Ossification is of more common appearance than is that of accidental cartilage. A cellular layer, a kind of periosteum, surrounds this

bony deposit, the existence of which is only demonstrable after maceration, and its function as periosteum is problematical.

Slight and oblique *contusion* may do little mischief to a cicatrix, but when this is violent, it almost always leads to ulceration. In all cases, there is a tumefaction and thickening of the tissue, due to the effusion of fluid. The cicatrix is easily destroyed, either wholly or in part; and then the tissues which it had retracted separate again by their own elasticity and muscularity. Ulceration takes place rapidly in inodular tissue, so that the wound may speedily resume its original dimensions. The secondary reparation is much slower, and its different phases are liable to interruption by various accidents. Inflammation and rupture of cicatrices, as a general rule, are more likely to occur at an early period of their formation. This depends upon their retractility being more active, and their organization less complete; while the surrounding textures, still nearly approaching a pathological condition, are very susceptible of undergoing alterations. At a maturer stage, the cicatrix will acquire a greater power of resistance. But when it is thin, when it covers an extensive surface, and when there is much loss of substance in parts subjected to frequent or extensive motion, we occasionally find an old cicatrix giving way as a consequence of slight external violence. The wounds of cicatrices made by pointed instruments of small size are not of much importance; and thus we daily find healing without difficulty the bites made by leeches, and the punctures made by a needle or a lancet, though these may traverse the entire substance. The action of a cutting instrument, applied to a large surface, is less inoffensive, reparation then requiring more care and time. Healing by the first intention is observed every day; and certainly the excessive care some surgeons take in avoiding old cicatrices is far from being always justified. Still, as this mode of reparation is sometimes defective, it behoves the operator to avoid such cicatrices as far as possible. If suppuration occur, it is very rare that the old cicatrix is not entirely destroyed, and that especially in the case of wounds from contusion or fire-arms. The ordinary phenomena of wounds of cicatrices are always more energetic than in the solutions of continuity of other tissues.

VII. *On the Treatment of Chorea by Gymnastic Exercises.* By Dr. Blache.

M. Blache observes, that two indications should guide us in our treatment of this affection: 1. To restore to the will its empire over the muscular contractions—i.e., regularize the movements; and 2. So to say, reform the constitution of the patients.

M. Blache regarded the methodical use of sulphur baths as the best constitutional remedy for the affection, until he had recourse to gymnastics. The great success which attended the application of these in 1847, under the skilful direction of M. Laisné, to scrofulous subjects at the *Hôpital des Enfans,* induced the directors to erect large gymnasia, and extend their employment to various other diseases, among which was chorea. In the present paper, M. Blache gives an account of 108 cases so treated, 100 being first attacks, and 8 only relapses—an important distinction, as the ordinary duration of a case of chorea is diminished by a number of relapses.

These 108 were divided into two categories, according to the severity of the disease; one of these being composed of 34 cases, of mean intensity, and the other of 74, in which the agitation was as violent as possible. The whole of the 34 were cured in a mean period of twenty-six days and eighteen *séances;* of the 74, 68 were cured in forty-five days with thirty-one *séances.* Therefore there remained but 6 cases which may be regarded as failures. These were examples of chronic chorea, which in the end was also cured, requiring 122 days and 63 *séances.* Calculating in another mode, we have 102 cases in 39 days, and 6 in 122 days.

For the description of the procedure that is had recourse to, M. Blache takes an aggravated case, in which the movements are violent and speech impossible. Here the will of the subject being powerless, nothing can be demanded of him; and the gymnastics must be entirely passive. M. Laisné, aided by three or four intelligent pupils, fixes the patient on his back in bed, and retains him thus motionless for ten or fifteen minutes. He then shampoos with the open hand the chest and limbs for a long time, following this by brisk friction. Similar manipulation is pursued at the back parts of the body, and especially at the nape, and over the muscular masses alongside the spine. A *séance* of this kind lasts about an hour, and is repeated for three or four days in succession. An amendment in the disordered contractions is observed after each; the child evidences its contentment, and calm sleep is restored. The following days, without entirely discontinuing the shampooing, the child is taught to execute very regular and perfectly rhythmical movements. Thus, suppose the arms are hanging in a state of supination by the side of the body, the operator takes hold of them by the wrist, bends the fore-arm upon the arm, carries the latter directly upward and forward, and then replaces the fore-arm in a state of extension. The hands are now raised in a parallel manner above the head, and from thence they are brought down to their point of departure, always following a well-marked ternary measure. This manœuvre is executed a great number of times, with much regularity. The inferior extremities are submitted in their turn to analogous movements: the leg is bent rapidly on the thigh, and this on the pelvis, when both are brought into extension, following a binary measure.

It is clear that the manipulations employed must impart remarkable activity to the capillary system of the skin and subjacent tissues, and through this to the intimate process of nutrition. The movements are so combined, that muscles whose motions are synergetical are brought into regular and simultaneous action. Unable to contract spontaneously and with regularity, they seem quite passive, so that the limbs may be bent or extended without the will of the patient contributing to the effect. Indeed, this generally opposes it, and it is only obtainable by employing a certain amount of force. But after one or two *séances,* the hand of the operator is enabled to follow the contractions which come to his aid with regularity. Every day the command of the will over the muscular system is strengthened, the abnormal movements at the same time diminishing in frequency and intensity. Not infrequently, during the first days, pains are excited in some of the joints by movements at all strong; but these, which some have considered of a rheumatic character, disappear after a few *séances.* After the employment of these passive movements for eight

or ten days, very marked improvement is observed, for the child can now speak intelligibly, feed itself, and, in some instances, walk about the ward. He now joins the gymnasium, and takes part in the exercises, under the surveillance of the master or a monitor-pupil. These exercises are graduated, and have in view the production of regular and easy physiological movements of the trunk and limbs—movements in which the will and the attention are called into play as much as are the physical powers. A great number of the manœuvres are performed in common, and during their execution the master and his pupils sing an air in two or three well-marked times, according as the exercises are performed in binary or ternary measure. The little patients, ranged in groups, are led away by the rhythm and by imitation. Other exercises are individual, and executed by each child according to its strength, all having for object the rousing the attention, and bringing the muscular contractions under the empire of the will.

The spirit of order and discipline exerts upon these children the most salutary influence. The attention, zeal, and great address of M. Laisné, aided by the means for ensuring safety in the gymnasium, have prevented any kind of accident occurring. During the first ten days, the children pursue the exercises with ardour. They are desirous of doing well, and their disposition seems to undergo a favourable change as they become more lively and open, and at the same time more docile. The organic functions are remarkably influenced from the first, the appetite becoming very keen, and requiring a proportionate supply of aliment; the muscular power increasing, and even already some increase of flesh being apparent. From the tenth and twelfth day, this amendment is subjected to some check; and we must now support the will and courage of the patient, and the more so, because the children endowed with most courage, determination, and docility, make the most rapid progress. After some days of this resistance, renewed improvement is observed, and we may be sure that the cure will now prove prompt and radical. Whatever the future may reveal, hitherto no relapse has been met with.

M. Blache enters into a comparison of the relative efficacy of gymnastics and sulphurous baths; and although employed alone, the former mode of treatment is to be preferred, yet the combination of the two modes is often desirable.

Besides the papers which we have noticed, the volume contains the following articles:—On the Culture of the Poppy in France, by M. Aubergier; On the Medicinal Properties of Saline Waters, by M. Carrière; and On Potable Waters, by M. Marchand.

Review VII.

1. *Das Medicinal Wesen des Preussischen Staates.* Dargestellt von Ludwig von Rönne, Kammergerichtsrathe, und Heinrich Simon, Stadtgerichtsrathe. Zwei Theile.—*Breslau*, 1844. pp. 786 und pp. 628.

The Medical Politics of Prussia. By L. von Rönne and H. von Simon. Two Vols., 1844, and Supplement 1855.

2. *Dictionnaire d'Hygiène Publique et de Salubrité.* Par A. Tardieu. Tomes III.—*Paris*, 1854. pp. 567, pp. 532, pp. 727.

Dictionary of Public Hygiène. By A. Tardieu. 3 vols.

3. *Médecine Légale, Théorique et Pratique.* Par Alph. Devergie, Professeur, &c., Membre de Conseil de Salubrité, &c., &c. *Avec le Texte et l'Interprétation des Lois relative à la Médecine Légale.* Revus et Annotés par J. B. F. Bebaussy de Robecourt, Conseiller à la Cour de Cassation, Chevallier, &c., &c. Troisième Édition. Tomes III. —*Paris*, 1852. pp. 743, 840, and 846.

The Theory and Practice of Forensic Medicine. By Alph. Devergie, Member of the Council of Health. *Containing the Laws bearing upon Forensic Medicine, with their Interpretation.* Revised and annotated by J. B. F. Debaussy de Robecourt. 3 vols.

4. *Code Médical, ou Recueils de Lois, Décrets, et Réglements sur l'Etude, l'Enseignement, et l'Exercice, de la Médecine Civile et Militaire en France.* Par Amédée Amette, Secrétaire de la Faculté de Médecine de Paris, &c.—*Paris*, 1855. pp. 470.

The Medical Code; a Collection of the Laws, Orders, and Regulations relating to the Study, Instruction, and Practice of Civil and Military Medicine in France. By Amédée Amette, Secretary of the Faculty of Medicine in Paris.

5. *Loi et Réglement sur l'Administration Générale de l'Assistance Publique à Paris.*—1849. pp. 7.

Law and Regulation regarding the General Administration of Public Succour in Paris.

6. *Manuel de la Cour d'Assises dans les Questions d'Empoisonnement.* Par M. Jules Barse.—*Paris*, 1845. pp. 104.

Manual of the Court of Assizes regarding the Questions of Poisoning. By M. J. Barse.

7. *On the Law of the Coroner; and on Medical Evidence in the preliminary Investigation of Criminal Cases in Scotland.* By James Craig, Esq., F.R.C.S.E., &c., &c.—*Edinburgh*, 1855.

8. *Illustrations of Medical Evidence and Trial by Jury in Scotland.*—*Edinburgh*, 1855.

9. *Essays on State Medicine.* By Henry Wildbore Rumsey. *London*, 1856. 8vo, pp. 424.

The "Metropolis Local Management Act" must be regarded as one of the highest achievements of modern civilization. Indeed, it may be

doubted whether a more important measure has passed the British legislature within the two last centuries; for of all the objects of legislation, none can be of higher or more paramount importance than the protection of the public health, the diminution of mortality, the prevention of disease, the prolongation of life. Having for its more immediate and primary aim the sanitary regulations affecting the health of nearly three millions of persons collected together within the Metropolitan Districts, the ultimate operation of this Act must be the conferring of incalculable social benefits upon the inhabitants of every city, town, and hamlet in the kingdom.

The good that shall flow from this source will, however, nearly wholly depend upon the manner in which its provisions are carried out. Among these the most essential is the institution of medical officers of health. It is not without reason, therefore, that the qualifications and duties of this office have occupied, and will continue to occupy, the anxious attention of all who have at heart the usefulness, the honour, and the dignity of the profession of medicine, thus entrusted to a few of its members, whose noble aim it should be to lead, not to follow the legislature, in matters sanitary.

Influenced by these considerations, we have thought that a small space of this Journal might not be unprofitably occupied by a comparison of the sanitary and medico-legal functions of the English officer of health, as compared with those of the German *physicus* and the French *expert*. To this end we have extracted, from the works above-named, the principal features of the sanitary and medico-legal arrangements now in force in France and Germany.

Germany.—A complete system of medical organization exists in Austria, Prussia, and the other German states. The principles of this system are the same throughout; modifications in details are, however, met with, as may be supposed, in different parts of so extensive a range of Europe as that over which the German language is spoken.

A Supreme Medical and Sanitary Council or College exists in the capital of each kingdom or state, forming part of the office of Ministry for the Interior, and is presided over by the Minister of Public Instruction. This central council, at the seat of government, superintends all medical affairs, and has the supervision of all the provincial and district medical colleges or sanitary boards. To take an example, we may state that the Supreme Medical Council of Berlin consists of certain members, appointed for three years, and eligible for reappointment. Of these, the majority are medical men, the following nine well-known names being those of the medical members of the Supreme College of Medical and Sanitary Affairs in Berlin: Klug, Könen, Horn, Link, Kluge, Wagner, Mitscherlich, Casper, and Froriep.

In the principal city or town of each province there is established a provincial medical college, consisting of a president (the governor or principal councillor of state), two physicians, one surgeon, one accoucheur, one apothecary, and one veterinarian. This provincial council has to forward periodical reports to the supreme college, and is empowered to require the aid and co-operation of the councillors of state and the police authorities, in carrying out its objects.

In every city, also, having more than five thousand inhabitants, there is, in addition to the provincial council, a special sanitary commission.

The efficient instrument, the right hand of these councils, without whose active and skilled co-operation their sanitary regulations would be so many dead letters, is the medical officer—the *physicus,* who, according as he resides in a capital or a city, or in a rural district, is entitled *stadt-physicus,* or *kreis-physicus.* The qualifications, duties, and obligations of this official, we propose here to lay before our readers.

The physicus is subordinate to his own medical council, and is amenable to the jurisdiction of the Minister of the Interior. He is charged with the execution of all the laws regarding the public health, and medical affairs in general. He is expected to follow the advances of science, that he may be enabled to make them bear upon questions relating to the public health. It is the more incumbent upon him to excel in acquirements and accomplishments, inasmuch as, having the precedence of all other medical men, he should be able to gain their respect and esteem, both by his personal conduct towards them, and by his counsel and assistance in promoting the common welfare.

The general qualifications required for the appointment of the physicus, are good moral character, and the profession of the Christian religion; no Jew being allowed to receive the appointment. The special qualifications of a candidate for this office are attested by the Supreme Medical College, before whom he has to undergo an oral and a written examination in the principles and practice of medicine, distinct from the examination *ad licentiam practicandi,* and to whom he is required to submit a thesis upon some medico-legal question.

The appointment is made by the Government, and is accepted under the obligation of an oath of loyalty to the Crown, and of faithfulness in the discharge of the duties of the office, which confers a certain rank and title, that of "Councillor of Health," equivalent to that of "Councillor of Justice" (*Gerichts-rath*).

The remuneration of the physicus is very much below what has been given to the English officers of health—averaging only about thirty pounds per annum, while the obligation and duties arising out of the appointment are extensive and onerous. The *stadt-physicus* or *kreis-physicus* is required to reside within his specified district or city, and, so far as practicable, to be within call on all occasions on which his services may be required. He may not absent himself without the permission of the local authorities, and is then bound to find a competent substitute. The physicus is exempt from serving on juries. He is required to wear a particular uniform when appearing in the performance of his public duties. The physicus has the superintendence or oversight of all other physicians, surgeons, apothecaries, midwives, barber-surgeons, and other medical persons resident within his city or district; it is his duty to see that they perform their duties efficiently, or restrict themselves within their several limits, as prescribed by law. He is required to report to the Medical College the fact of any unqualified person undertaking the practice of medicine or surgery. It is the duty of the physicus to see that the medicines of the apothecary are pure, for which purpose he is required to make special visitations and inspection. He must report

to the police authorities, periodically, any alterations in the prices of drugs. He has to take care that the business of the apothecary be not interfered with by medical men dispensing their own medicines; and on the other hand, he has authority to protect medical practitioners from encroachments by the apothecary. In general, however, the limits of practice are so distinctly observed, that little occasion occurs for the exercise of this authority.

An acquaintance with prevailing diseases, whether in man or in animals, is expected of the physicus. To gain this, he is empowered to require reports of cases attended by other practitioners. It may be noticed that this forms one of the immediate advantages of the appointment of officers of health in the British metropolis, other practitioners having in most of its parishes received instructions to give notice to the officer of health, of the existence of epidemic disease, or of any other circumstances affecting the public health. With the same view, the physicus is directed to make himself familiar with the occupations and habits of life of the residents in his city or district, as they may affect their health; he must also inform himself upon the topographical and meteorological features of his district; he must on all occasions be ready to give his advice to the authorities in adopting measures for the prevention of the spread of disease. With the same object, the kreisphysicus must furnish to the Provincial Medical College periodical reports upon the state of the public health in his district, giving a full account of the prevailing diseases, their probable causes, &c. He may demand the aid or consultation of other civil or military medical officers when in doubt upon any question affecting the public welfare, or when from spread of disease the cases are more numerous than he can himself attend to.

The physicus cannot refuse his medical services to any one who may require them. He is permitted to receive remuneration from the rich; for his attendance upon the poor he has a claim upon the public purse He has medical care of all paupers, prisoners, or soldiers, not under the special charge of any other medical officer. Our own health officers have not this onerous charge.

Throughout Germany, the physici are the special medico-legal officers, to whom is confided the investigation of all medico-forensic matters. As already stated, each country is divided into districts, having severally a physicus, or "*Gerichts-Arzt*," with his associate surgical officer (*der gerichtliche Wundarzt*). These officers are paid by the Government. The respective tribunals or judges may require their services in all inquiries touching sudden or violent deaths. A legal dissection is made by them, in the presence of the judge, and a written statement of what is then found in the body is dictated by the physicus. In all deaths from poisoning, the œsophagus, stomach, and duodenum having been carefully tied, are removed, and separately examined by the physicus in conjunction with an apothecary.* A report of the result is made to the tribunal. The "physicus" is required to investigate all cases of rape, simulated disease, or mental diseases, and to report thereon to the judge.

* The German apothecary corresponds to our pharmaceutical chemist; he passes a rigorous examination, and is debarred from medical practice.—ED.

If the case be very complicated, or if doubts still remain, the tribunal send the report of the medical officer to a provincial college, together with all other depositions. These colleges are required to report thereon to the tribunal. If still any doubt or difficulty should present itself to the judge or tribunal, there is yet a higher authority to which application can be made,—viz., the "Superior Medical College," the central authority for the whole kingdom, having its seat in the metropolis. To this highest authority the reports of the medical officers, and of the provincial colleges, are referred for the purpose of obtaining a "*super arbitrium.*"

Within the last few years, the proceedings are carried on publicly and before juries, in all important criminal trials. The "physicus" is required to appear before the jury, and *vivâ voce* to explain his report and opinion. The accused may also call other medical opinion. "Not seldom, an opposition between the public and the private medical men takes place, the public being present; which I cannot find very advantageous for the dignity of our state and science;" observes the celebrated Casper, of Berlin, in a communication with which he has favoured the writer. Dr. Casper has been thirty years a member of the "Superior College" at Berlin, and upwards of fifteen years "Stadt-physicus" of Berlin.

The forensic duties of the *physicus* are under the direction of the supreme judicial courts and of the police authorities of the district, or of a local magistrate. With the assistant forensic surgeon, the physicus, in the event of sudden or violent death, is required to repair, without loss of time, to the spot where the body is to be examined. The judicial inspection is required to be made according to special instructions issued to that end. In cases of poisoning or adulteration of food, the physicus shall very carefully and scrupulously investigate the case with the assistance of a qualified apothecary. A conjoint report shall be signed by these three officers—viz., the physicus, the surgeon, and the apothecary—not only to verify the truth thereof, but also to divide the responsibility of the consequences that may thence follow.

When his presence at a legal dissection is required by a magistrate, the physicus is ordered to do so with all possible expedition, and shall see that the forensic surgeon be provided with the requisite instruments in proper condition for use. If the body to be examined be that of a still-born infant, all outward appearances from head to foot must be recorded; the degree of its development; the state of the tongue as to protrusion from the mouth; the condition of the latter, whether containing mucus or any foreign substances; the state of the navel string, whether tied, cut, or torn. In examining a body, the state of the heart and large vessels, whether full or empty, as well as the exact condition of the larynx, lungs, &c., should be accurately noted. The organs in all the cavities should also be accurately observed. All wounds of the internal organ should be closely compared with those discovered externally, in order to determine whether the latter have been mortal.

In large cities or towns, there are provided also, for the especial purpose of facilitating the ends of justice, one or more police *physici*, whose functions are in some measure indicated by the epithet, and will further appear in our subsequent remarks. The distinction is, however, one

rather arising out of the practical requirements of cities, than one established by law. The police physicus is more directly connected with the police department, and is under the jurisdiction of the President of Police, to whom he must communicate all matters relative to the public health that may come under his notice. The police physicus is invested with authority to make inquiries, in the discharge of his duties, without the attendance of a police officer; in so doing he is, however, required to appear in a police uniform. If any case of illness should come under his notice, having originated in a quarrel or fight, the police physicus shall take notice particularly whether life is endangered by the injuries that have ensued; in which case he is expected to give information thereof to a magistrate. If it should come to his knowledge that any individual has died suddenly, without previous illness, and there be any ground to suspect that death has not arisen from natural causes, it is the duty of the police physicus to investigate the case, and ascertain whether there be sufficient reason to demand a magistrate's order for dissection. Any traces or indications of poisoning must be carefully looked for by him. The carcases of animals that have died of epidemic disease, or from any prevalent or similar cause, shall be opened before the police physicus, who shall make a written statement of the internal appearances, particularly of the stomach, noting at the same time what medicinal or therapeutic measures have been adopted during the life of the animal.

If in the course of his dissections the police physicus shall meet with any unusual specimen in natural history, or any monstrosity, he shall transmit the same to an Academy of Sciences, or to a Professor of Anatomy.

The police physicus must prepare for the President of Police, a quarterly report of all the judicial investigations and dissections performed by him during the quarter. In the discharge of his duty of examining the bodies of still-born children, he has opportunity of controlling the practice of midwives, and noticing any neglect of duty or transgression of the legitimate limits of their practice.

The police physicus has the superintendence of all the insane, of all prisoners, the surgeons of jails, to see that these latter act humanely towards prisoners, in discharge of his duty. He has the particular supervision of, and control over the forensic surgeon, and is required to ascertain that the latter performs his duty, in taking such measures for the prevention of syphilis as are indicated by science. For this purpose he is to call for monthly oral and written reports of all such cases, and from time to time to make a personal inspection of the manner in which this duty is performed. By these means he will become acquainted with the degree to which venereal poison is spread; he shall make experiments thereon, and shall embody the results of these reports and observations in his quarterly reports; wherein, also, he has to state the number of prostitutes, either in or out of brothels, together with the number of cures of venereal disease.

The objects of sanitary police which become the immediate duty of the medical colleges and the physici, are all those measures which may be necessary for the removal or suppression of the causes of disease, either as affecting individuals, or as spreading through a community. For this

purpose, the physicus has authority, in the case of infectious maladies, to enforce the separation of the sick from the healthy. The inspection of dwelling-houses, as to their ventilation, &c., also forms part of their duty. The sanitary regulations are directed to the prevention of hereditary disease, by the prohibition of unequal or premature marriages, and marriage between near relations; by the care of infants, and by the training of youth. The Prussian laws in these last matters are far more arbitrary than we in England should deem consistent with the liberty of the subject. The laws regarding pregnancy, abortion, and infanticide are among the subjects that come under the consideration of the sanitary police, as are also the examination of articles of food, the inspection of slaughter-houses, breweries, &c.

The police physicus is required to take cognisance of all poisonous substances employed in arts, trades, confectionary, &c., or in the manufacture of earthenware utensils. The regulations respecting interment are under the control of the sanitary police; as are also the dead-houses.

Vaccination comes within the province of the police physicus, who must superintend its performance by other medical men, and use every means to remove prejudices or other obstacles to its extension.

Upon these and all other matters coming within the scope of his public functions, the physicus must present to the Medical College a quarterly report, besides periodical and special reports to the police authorities when called for. These reports must record the occurrence of epidemic disease, with suggestions on the means of their prevention. Instances of malpraxis must also be reported.

The preceding summary includes, we believe, all the most important or most essential features in the functions, duties, and responsibilities of the German physicus, and the legal enactments respecting medical, sanitary, and medico-legal affairs in the German States. We proceed, in the next place, to lay before our readers a sketch of the same subjects as at present existing in the French empire.

France.—We are accustomed in England to hear and speak of the French "*experts*" as of a distinct class of medical men: as such, however, they do not exist in any formal or legal sense; although, practically, *experts*, distinguished as such from their medical brethren, are to be found in nearly all large towns or cities. The great care and attention bestowed by the State upon the public health has created a demand for the special skill and attainments required to cope with questions of hygiène and medical jurisprudence: the demand has been very fully met. The assumption, however, of the character and functions of an *expert* is entirely voluntary; but having been undertaken, their non-performance incurs penalties. Although in practice the medico-legal relations of the profession in France have thus come to assume an apparently positive form, these are by no means so certainly defined as are the duties and obligations of medical men in general, with reference to matters of public hygiène.

The attention that has been bestowed upon the care of the public health in France may be inferred from the number and high character of the works that have emanated from that country upon hygiène. The following remarks, from a leading article in the 'Medical Times and Gazette'

(Sept. 8, 1855), having reference to Dr. Waller Lewis's valuable Report upon Unhealthy Trades in Paris, very forcibly and correctly puts this matter before us:

"We learn from Dr. Lewis's Report that, at a period when France had barely recovered from the fury of the first Revolution—namely, on the 12th of February, 1806—the prefect of police prohibited the establishment in Paris of any workshop, manufactory, or laboratory, which could endanger health, without a statement of its nature being made to the prefecture, and a strict examination being instituted as to the mode in which it was to be conducted, and its probable influence upon the physical condition of the population. But as these regulations were imperfectly carried into execution, the Minister of the Interior consulted the Academy of Sciences on the measures necessary for the regulation of manufactures in regard to their effect on public health. Now, mark the persons chiefly concerned in reporting on sanitary measures—not lawyers, nor placemen, nor politicians, even at a time of intense political excitement—but men eminent in science—namely, Guyton Morveau, Chaptal, and George Cuvier; and upon *their* Report was based a decree, dated the 15th of October, 1810, and an ordonnance, dated the 14th of January, 1815, which two documents regulate all sanitary subjects up to the present day. Thus, while France was distracted by political excitement, while she was emerging from her first Revolution, while she was under the empire of the first Napoleon, and while she was struggling with the military forces of all Europe, she still was attending to the physical welfare of her people, and establishing laws for the preservation of public health, based upon scientific data. During the stormy periods of French history which have succeeded the memorable year 1815—during the reign of the Bourbons—a second Revolution—an Orleanist dynasty—a third Revolution—a second Republic—a second Empire—no attempt has been made to reverse the laws and ordonnances relating to the public health in France. The changeable population of that great country, fickle in almost all other respects, have yet learned to regard the sanitary condition of the nation as one of the chief objects of every form of government, whether imperial, monarchical, or democratic, and have cheerfully submitted to the necessary and wholesome restraints imposed by hygienic laws and enforced by executive authority.

"All dangerous, unhealthy, or inconvenient establishments in France are divided into three classes, and Councils of Health are appointed in different localities to regulate and control the formation and the operations of such establishments. The establishments of the *first* class are those which must be kept at a distance from private habitations, and which require for their legalization the authority of the Government: those of the *second* class are such as do not rigorously require to be kept at a distance from habitations, but are compelled to give an assurance that the operations proposed to be carried on in them are executed in such a manner *as not to be a nuisance to the neighbourhood, and not to cause damage;* those of the *third* class are such as may remain without inconvenience near dwellings, but are subject to the *surveillance* of the police."

The existing organization of Councils of Hygiène and Public Salubrity, is based upon the decree of December, 1840, and of additional decrees, dating 1849 and 1851. In the chief city or town of every *arrondissement* in France a council of hygiène exists, and in every canton a committee of public health.

The Councils of Hygiène consist of not less than seven nor more than fifteen members, appointed for four years, one-half retiring every two years, but eligible for re-election. The members are medical men, agriculturalists, commercial men, proprietors, mayors, engineers, magistrates, and others who, by education and social position, are regarded as capable of judging of matters of hygiène. The medical elements of these councils are

distributed as follows:—In a council consisting of ten members, there will be four doctors of medicine or surgery, two *pharmaciens*, and one *vétérinaire;* in a council of twelve members, there will be five doctors, three *pharmaciens*, and one *vétérinaire;* in a council of fifteen members, there will be six doctors, four *pharmaciens*, and two *vétérinaires*. The advice and assistance of civil and military engineers, official architects, and of the chiefs of the police departments, may be called for if required by the councils, although they may not be members thereof.

The really local character of these councils of health is evident from the fact that, out of 1742 members thereof, 1544 are resident in the chief towns of the several *arrondissements* and departments, while the remaining 198 reside at greater or less distances within the department or *arrondissement*, and include the most important and most distinguished of their inhabitants.

The proceedings of the several councils of the *arrondissements* are subjected to the consideration of the councils for the departments, whence they are annually transmitted, through the Central Council of Hygiène in Paris, to the Minister of Commerce.

Paris has its own special arrangements relative to public hygiène, known as the Council of Hygiène and Salubrity of the Department of the Seine. In each of its *arrondissements*, a commission of nine members, presided over by the mayor of the *arrondissements*, in the city, and by the sub-prefect, in the suburban districts. Besides certain of the principal inhabitants, there shall always be, in each commission, at least two physicians, a *pharmacien*, a *vétérinaire*, an architect, and an engineer. These members are nominated by the prefect of police, from a list of candidates prepared by the mayor or sub-prefect of each *arrondissement* or rural district. The members are elected for six years, one-third going out every two years, the retiring members being eligible to re-election.

These councils and commissions meet not less frequently than once a month, and more frequently if the public service require it. They shall point out to the prefect of police all causes of insalubrity existing in their districts, and shall give their advice on the means of their removal; and may be required to give their advice also to the departmental councils. They may be called upon to execute extraordinary measures for the suppression of epidemic disease.

Among the duties of the councils of hygiène are, cleansing of localities and habitations; the adoption of measures to prevent the spread of epidemic and infectious maladies; the extension of vaccination; the organization and supply of medical assistance to the poor; the means of improving the sanitary condition of industrial and agricultural populations; the salubrity of factories, schools, hospitals, asylums, barracks, prisons, &c.; questions relating to foundlings; the quality of food; the improvement of public mineral waters, and the rendering these available to the poor; the removal or suppression of dangerous or insalubrious establishments, or nuisances; the supervision of public works, such as the construction of prisons, schools, canals, reservoirs, fountains, cemeteries, sewerage, &c., &c.

These councils shall also collect the statistics of mortality and its causes, together with the topography of each *arrondissement;* and shall

regularly transmit all such documents to the prefect, who shall forward them to the Minister of Commerce.

A central council of hygiène and public health, at the seat of Government, presides over all the other councils, and over medical affairs in general, and is charged with the examination of all questions on hygiène referred by these, or put before them by the Minister of Commerce and Agriculture. The members, seven in number, are nominated by the same functionary; they consist of four doctors of medicine, a civil engineer, an architect, and a secretary having a consultative voice. They may require also the attendance of one member respectively of the Military and Marine Councils of Hygiène, of the perpetual secretary of the Academy of Medicine, and of certain public functionaries—e.g., the chief of the sanitary police department, the architect, the chief of the post-office packet department, of the administration of tolls, &c., &c.

The *Criminal Code* (Art. 44) directs that in the event of a violent death, or of one to the cause of which suspicion may attach, the procureur shall call in the aid of an *officier de santé*,* who shall submit to him a report upon the condition of the body, and the cause of death. In the *Civil Code* it is directed that when suspicion exists of violent death, interment shall not take place until a police officer, assisted by a doctor of medicine or surgery, shall have prepared a *procès verbal* as to the state of the body, and other circumstances, such as the name, age, residence, &c. of the deceased. The choice of the medical officer is left to the magistrate, who, although the matter is of equal weight in either case, may call upon a physician, being an *expert*, or upon an *officier de santé*, who in the medical hierarchy has no rank, or only the lowest. The education of the *officier de santé* is inferior to that of the physician or surgeon, his functions are restricted, surgical operations not being performed by him. The *officier de santé* seems, in fact, to occupy a position in some respects similar to our now obsolete "apothecaries," but the former does not practise pharmacy.

It must be supposed that the framers of the above-cited clauses of the criminal and civil codes regarded the mere skill in making a technically expressed report as being of higher value than the scientific qualifications of the individual to whom an important public duty was to be assigned by the magistrate. Or, they may have considered that a mere *officier de santé*, on the spot, in the communes or rural districts, would be more suitable for these investigations than a physician residing at a greater distance. The result, however, is that the opinion of an *expert* is frequently required in a subsequent stage of proceedings; Article 43 of the Criminal Code giving the procureur the power to summon the assistance of whomsoever he may deem the most skilled in his profession.

The official reports of the *expert* must contain all the information which his experience shall enable him to suggest relative to the presumed intention or premeditation of an alleged crime, so far as inferences may be drawn from the appearances of the body, of wounds, or of the characters of weapons found.

* In the words of M. Devergie: "L'expression, *officier de santé*, qualifie un homme apte à donner des soins en cas de maladie, et pas autre chose. On n'y entend pas un grade, un rang dans l'hiérarchie médicale." (Tom. i. p. 4.)

An autopsy is performed upon the authority of the procureur or his deputy. Exhumations are ordered only in extreme cases. The autopsy is to be performed without delay, and the authorities are required to see that the investigation is closely conducted, and that traces of crime are not thereby obliterated.

The reports of *experts* are of three kinds—viz., judicial, administrative, and estimative. The *judicial* or *official* have for their object the elucidation or discovery of an alleged crime. The *administrative* have reference to questions touching public health. The *estimative* refer to disputed remuneration. Besides these reports, the *expert* is frequently called upon to give a simple certificate or statement of a fact, not in behalf of justice, or attested by an oath, but for inaccuracy of which he is, nevertheless, amenable to punishment.

We may represent by an imaginary case the mode of proceedings and position of the *expert* in France.

Supposing that a man is found dead in a room, the police requires the attendance of a doctor, or *officier de santé*, to attest the death, and to state the probable cause of death. Should any wounds or other indications of violence be apparent, these must be noted; and simply confining himself to the facts before him, the medical man must, in a *procès-verbal*, state his suspicions, and indicate whether or not these require that the body be opened.

By a police ordinance of 1801, every medical man is required immediately to report to the police the particulars of every violent or accidental death to which he may have been summoned.

This primary report is forwarded by the police to the *procureur*, who, if he consider the suspicions of a crime to be sufficiently strong to call for further proceedings, appoints a *juge d'instruction*, who then nominates two physicians to inspect the body in the presence of either himself or his deputy. These physicians draw up an official report of what they observe, with their interpretation of the facts, and the conclusions thence to be drawn.

These two reports may, however, fail to explain with certainty the cause of death, or they may raise difficulties not previously contemplated. For the solution of these, the *juge d'instruction* shall charge two or more physicians with the duty of examining and advising upon the preceding reports; at the same time he shall submit to their consideration all other documents that may tend to throw light upon the inquiry. All these are digested and discussed in a *medico-legal consultation*, in which the last *experts* examine, in all their bearings, the facts and conclusions drawn by previous reporters, either confirming or reversing these. This "consultation" is not the subject of a special law, but is governed by those which rule the production of the "reports;" the several *experts* being convened by the *procureur* or magistrate, in the regular form of summons for a report.

The medico-legal "consultations" may have two different sources—they may be demanded either by the accused, or by the judicial authorities. They are usually held before judgment is passed; but if the condemned have an opportunity of appeal, he may demand a "consultation" subsequently—sometimes with the effect of reversing the sentence. The

strictest impartiality is enjoined upon the *experts*, whether engaged by the defence or the accused, with the proviso that in case of doubt the benefit be given to the accused.

The experts thus called in "consultation" do not necessarily reside in the locality where the alleged crime was committed, but may, if advisable or necessary, be summoned from a distance. Or it may happen in more grave cases, such as poisoning, assassination, &c., that there may be a difference of opinion among the "experts" who have investigated the affair on the spot. Under these circumstances, the magistrate addresses to the local *juge d'instruction* a *commission rogatoire*, by which he is authorized to require the opinions of certain "experts," the choice of the latter being frequently left to his discretion. The limits of the "consultation" are much less restricted than are those of the "reports," which consist simply of a statement of facts and conclusions. In the consultation every fact must be discussed and fully commented upon, the commentary being strengthened by all suitable arguments, and illustrated by reference to the statements and opinions of authors. The names of the previous "reporters" are in all cases concealed from the consulting "experts," lest the authority or insignificance of a name should exert its undue influence upon their judgments. The several parts of the evidence are separately examined by each expert, previously to their joint consultation. The result of the consultation is delivered in four distinct parts:—1. The preamble, a simple enumeration of the points submitted for deliberation. 2. The exposition of facts, in which all the circumstances and events are set forth in their exact order. 3. The discussion of the facts, which is the most difficult portion of the duty of the experts, requiring much sagacity and discrimination, and demanding research, experiment, scrutiny of proofs, and the collection of facts, for the guidance of the magistrate or judge. 4. The conclusion, in which the results must be briefly and clearly stated, together with the grounds of difference (if existing) from the conclusion of previous reporters.

It is apparent that the "expert" must possess not only practical skill, but should have also an extensive and ready acquaintance with the recorded facts and opinions of medico-legal writers. Their reports constitute the ground of action determining the prosecution or abandonment of legal proceedings; and in the event of trial, they are in the position of witnesses, although, as observed by M. Devergie, they are there in a false position, since, as representatives of science, they should not be called upon to advocate any particular interest. At the tribunals, the "experts" are required to depose to all that they have observed, and recorded in their reports; they have, moreover, to respond to questions put either by the judge, the jury, or the procureur. Their replies may give rise to further explanation, and the demand for additional evidence, and occasionally lead to controversy and discussion in the court between experts on the side of the prosecution and of the defence. To this M. Devergie very justly objects, and urges that the duty of the expert should be confined to the statement and the interpretation of facts and their legitimate conclusions, irrespective of any civil or criminal questions.

In order to meet these objections, M. Devergie suggests that there should be three grades of public or official experts, liable to be called upon

by the judges, mayors, justices of the peace, prefects, and sub-prefects: the first to be attached to the *Cour d'Appel;* the second, to the tribunals of each *arrondissements;* the third, to the local courts of the *cantons.*

It has also been proposed by M. Barse, that a college of experts should be established, to which reference should be made in all difficult cases, and in which institution he considers that society would have all the guarantees it could require for the unbiassed and exact application of science to all medico-legal questions, while experts themselves would acquire increased confidence in their conclusions, from the weight and dignity with which they would be invested as the reports of the college. M. Barse proposes that the institution be divided into two sections, chemical and medical; directed by president, vice-president, secretary, &c., chosen from its own body. Every investigation to be submitted to not less than three members of this college. The proceedings of the college to be published at regular intervals; the council having authority also to publish original articles by any members of the college.

The "reports" which have been mentioned as "administrative reports," are those which relate especially to matters affecting the public health. They call for as much care and exactness as is demanded for the preparation of criminal reports, inasmuch as the comfort or even the existence of many individuals or of a neighbourhood may be involved therein. The duty, obviously, should not be undertaken by those who do not possess the requisite knowledge of chemistry and manufactures. In large towns, these functions are performed by the Councils of Hygiène and Salubrity.

The duties and qualifications of the English "Officers of Health" are now generally known, and have been fully stated in this Journal (April). They are of no light character; they are not restricted to any narrow or special field of sanitary quackery; but will demand a practical knowledge of medicine, and something more than a superficial acquaintance with collateral sciences. Sir B. Hall has well summed up these in the following remark to a deputation that waited upon him to learn his views on this subject:

"He desired the appointment of men of such high position and acknowledged qualification that, in case of a return of epidemic, they might meet as a general medical council for the whole metropolis, and draw out a system of sanitary regulations which, bearing the authority of their names, would be universally respected."

The combined weight of the experience and attainments of the Officers of Health would not only, in the times of danger referred to by Sir B. Hall, but at all times, constitute such a general medical council as shall be "universally respected." From the close connexion of this council with the central council of vestrymen, the necessity for other non-medical Boards of Health would cease. All their functions would be absorbed by the more efficient medical council.

The Boards of Health that have existed hitherto have been proved to have been powerless for the removal of causes of ill-health; the law was indefinite, and the determination of nuisances prejudicial to public health depended upon the views of persons incompetent to form conclusions thereon, while decisions could be reversed by appeals to higher courts of judicature. The whole of our sanitary legislature has been a tissue of uncertainty and doubt. The new Metropolis Local Management

Act removes much of the complicated machinery that stood in the way of the application of remedy, and by the formation of a corps of scientific and trained health officers, has paved the way for the attainment of certainty, and has given confidence in the beneficial operation of our sanitary regulations.

An association comprising all officers of health, and others interested in the advancement of sanitary and medico-legal science, would doubtless prove a powerful means to this end. We have now all the elements for he formation of a British society of experts, analogous to the college proposed by M. Barse. Experience is yet wanting to most of the newly-appointed officers of health, but as this is accumulated, if it be enlarged and corrected by comparison and discussion, the result must be that greater precision will rapidly be attained, and the public proportionately inspired with confidence in the opinions of those to whom they have entrusted those hygiènic and medical affairs which alone can be safely confided to professional hands. It may be hoped that an association of this nature will ere long be in course of formation.*

Thus, besides the duties immediately of a sanitary nature, the medical officers of health will eventually be looked up to as the most trustworthy aids to the coroner in the prosecution of medico-legal inquiries. Such assistance is absolutely needed in most law courts, as well as the coroners' court. The irregularities and oversights now too frequently occurring before the coroner's tribunal would, under such circumstances, be much less likely to occur. The progress that would be made in the diffusion and improvement of medico-legal science, by the greater certainty and facility that would be afforded for the detection of crime, would have the effect of deterring from its perpetration. It may seem superfluous further to allude to the need actually existing for improvement of the coroner's court in England. But a still more lamentable want of a medical jurist is to be found in Scotland, as Mr. Craig shows in the pamphlet named at the head of this article. The coroner's court does not now, although it did anciently, exist in Scotland. The following is the practice of inquests in that portion of the United Kingdom, as stated by Mr. Craig; it is very different to the practice in England or Ireland, where direct application to the coroner may at once obtain an inquest, if there be ground of suspicion:

"1st. In all cases of sudden death, the district constable repairs to the place where it has occurred, collects information, and sends off a report immediately to the superintendent; and, in cases of rape, child murder, or concealment of pregnancy, the *constable* is to ascertain, with precision, all appearances exhibited, such as marks of feet, blood, &c. &c. If there be any circumstance calculated to raise ground of suspicion as to the death, such as external marks of violence, bruises, fractures, &c., the constable is to apply to the nearest medical man without delay, and, after an examination, is to obtain a certificate, and forward it immediately to the superintendent. In all cases of serious assault, and where death is likely to occur, the constable, without delay, procures the assistance of the nearest medical man, and sends off a report, as before described; and instructions are given as to what circumstances the medical man is to certify. Upon receiving such a report, it is laid by the superintendent before the procurator-fiscal of the county, who either acts upon his own responsibility, or occasionally

* The metropolitan medical officers of health have recently formed themselves into an association.

takes a fresh precognition, and prepares a case to submit to the crown-agent, to whom the police reports are also frequently sent, and whose instructions are thereafter acted upon."

The "Procurators-Fiscal" are legal officers appointed by the Government to each county, their duties being to inquire into alleged crimes, to receive the reports of the police, and to determine whether prosecution shall be undertaken. In the event of a trial, the medical attendant of the person to whom violence or accident has occurred is required to give evidence and assist the court by his opinions. Should the condition of the person so injured be supposed to be such as shall endanger life, the procurator-fiscal may require that the police medical officer shall visit and examine into the state of the health of the person, in order that he may report whether he is in a fit state to "emit a declaration," or make a statement of the circumstances attendant on the accident or violence, to the sheriff, in order that important evidence may not be lost by the death of the injured.

Some change is evidently demanded where the initiation of an inquiry involving questions of life or death is dependent upon the caprice or conceit of a parish constable. No stronger proof could be afforded of the importance of medical knowledge in the institution of inquiries touching the causes of death, than is afforded by its total absence in this instance beyond the Tweed. So protective to criminality is the existing order of things, that Mr. Craig, in his very striking pamphlet, informs us that it was a matter of discussion among the servants of a family whether it was better to have a bastard child in the town or in the country; they came to the conclusion that a child is more easily disposed of in towns. Surely it is high time that the practice of the English laws of coroner, registration, and medical officers of health, should be extended northward. Mr. Craig relates an instance also of the deaths of both child and mother after the obstetric administration of chloroform, and interment without inquiry. While we congratulate ourselves that such occurrences can scarcely take place in England, we regret not only the impunity it offers to crime or rashness in Scotland, but we also regret the confusion it necessarily introduces into the statistics of the results of any novel or hazardous line of practice.

The appointment of a Public Prosecutor has repeatedly been spoken of, and the proposition had so far assumed a definite form, that early in 1854, a bill was introduced into the House of Commons by Mr. Phillimore, for the express purpose of creating public officers under this name. The bill meanwhile was withdrawn, upon assurance given by the Attorney-General that he had been requested by the Government to prepare a measure having the same object. This bill, however, so far as we are aware, has not yet been brought under the notice of the legislature.* Its principal features were such as to promise much improvement upon the present mode of proceeding. The bill proposed to divide the country into districts, with a public prosecutor for each, whose functions would resemble those of the *Procureur Impérial* in France.

That the introduction of this functionary into our system of criminal

* While writing these observations, the Report of the Select Committee of the House of Commons, recommending the appointment of public prosecutors, is published. 'The Times,' May 29th.

jurisprudence would be in the highest degree advantageous, none but those who have a personal interest in existing arrangements can doubt. Aided by the counsel of officers of health, or by those eminent medical jurists which it is the honour of Great Britain to possess, the jurisdiction of civil and criminal courts would cease to furnish so many examples of prosecution carelessly conducted, evidence destroyed or overlooked, and guilt escaping.

From the preceding remarks, it will be seen that, in many of their most essential and most useful features, the new officers of health approximate to the German *physici*. The French system of the administration of hygiènic affairs, resembles the functions and powers of our English boards of vestrymen under the new Metropolitan Local Management Act. The extension of the principles of this legislation to other towns will complete the resemblance, and extend the operations of so beneficial a law.

As it is among the German *physici*, and among the medical members of the French Councils of Hygiène, that forensic medical science is sought and found, so it must eventually come to pass that the medical sanitary officers of England will constitute the body in which medico-legal science will be most assiduously and most successfully cultivated. The sanitary and the forensic duties of officers of health are closely associated—the qualifications which fit them for the performance of the one especially adapt them to the requirements of the other. As, by the new act, the British legislature is expressing a just appreciation of the scientific attainments of the medical profession, and regarding its members as the only trustworthy advisers in all questions affecting public health, it must of necessity follow that public opinion will concede the highest respect to the opinions given in courts of justice, by an experienced body of scientific *experts*, upon all medical questions involved in criminal or civil jurisprudence.

We regret very much that the late period at which we received Mr. Rumsey's work has prevented our incorporating with the preceding observations our abstract of its contents. We are at present limited to a brief analysis of the several essays. Doubtless, frequent future occasions will occur to induce us to bring this work under the notice of our readers.

Mr. Rumsey, in common with all who have bestowed any attention upon the subject, is struck with the entire absence of design exhibited in the sanitary legislation that has hitherto been effected in this country. So desultory and unconnected have been the labours of our countrymen in all that relates to State medicine—so systematic has been the study of "*hygiène publique*," or of medical polity, "*medicinal polizei*,"* among our continental neighbours, that British writers and sanitary officers must consult German or French authors if they would devise a comprehensive scheme of State medicine. So true is this, that even Mr. Rumsey's essays throughout have the German type very distinctly stamped thereon, although he has not been entirely led by French or German systems. The arrangements of detail are necessarily influenced by the existing legislation of this kingdom, imperfect as it is.

In his Introductory Essay, Mr. Rumsey observes:

* Medical police has in Germany the more extended signification of medical *polity*, rather than of *police*, as generally received among us.

"Had it been my intention, in the following pages, to treat methodically of all the various matters pertaining to the care of the public health, for which either the enactment of special laws, or the delegation of discretionary power to constitutional authorities, has been found necessary in this and other countries, I should, both as regards matter and arrangement, have drawn more or less from some of the most approved treatises, chiefly German and French, which have been published within the last eighty years on the Continent; for, to say the truth, this subject has never been systematically written upon in England.

"Or, had I wished to describe in detail the most successful methods of effecting a few sanitary objects, special in kind and limited in application, I should have examined the measures now in progress in certain cities and towns, at home and abroad; I should have compared these, not merely with some of the public works and municipal regulations of ancient times, but also with those other more appropriate and practicable projects, suggested in many pamphlets and reports on sanitary affairs, which have deluged this country during the last twenty years." (pp 3, 4.)

The author's design is to offer a scheme of *agenda* in State medicine,—suggestions as to what he deems advisable in the relations of the science of medicine to the State executive. These he comprises in three great divisions:

"I. In relation to subjects concerning which the State should direct INVESTIGATION.

"Whether these be—

A. Statistical.
B. Topographical.
C. Jurisprudential.

"II. In relation to PRACTICAL ARRANGEMENTS for the personal safety and health of the people, requiring for their enforcement either direct or legislative enactments, or local institutions and regulations.

"These may be subdivided into—

A. Preventive, and
B. Palliative, measures.

"III. In relation to the establishment by law of an ORGANIZED MACHINERY for carrying into effect the aforesaid inquiries, for deliberation and advice on special arrangements and emergencies, and for the administration of existing laws.

"And this would comprehend—

"*A.* The education of medical men, and the qualification of other technical, scientific, and administrative agents.

"*B.* The institution of official authorities—board and offices—for central and local superintendence and action." (p. 6.)

Under the suggestions regarding statistical records, Mr. Rumsey enumerates all the data that can be of any public importance, and some which we think Englishmen would be prone to count as private. The regulations which the author would advise for the prevention of disease are most judicious, but have many of them a somewhat too paternal character; for instance, Mr. Rumsey would prohibit the erection of buildings in districts where permanently unhealthy influences are confined to a limited area; and also the extension of towns in the direction of sources of malaria. Such stringent laws would directly raise questions of the rights of property, and would enlist a host of opponents to hygiënic legislation. We doubt also whether legislative interference would, in this country, ever be permitted to that extent that the author thinks desirable in the construction of houses, streets, &c. &c.

As, however, the first Essay proposes only the outlines of a sanitary code, we need not too closely criticise every detail. Mr. Rumsey has clearly drawn his outline from the model of Continental systems, where Governments act for, and supersede the intelligence and free action of, the people. It is not to be supposed, however, that because we find laws promulgated they are always executed. There are many Continental towns enjoying the advantages of very wise sanitary and hygiènic laws, but where the want, as Mr. Rumsey observes, "of English capital and energy have prevented the application of engineering skill to the execution of great works of purification."

We must not lose sight, however, of the fact that many of the author's suggestions are the subjects of existing Acts of Parliament. We may instance the laws regulating the employment of children in factories.

In the succeeding Essays, Mr. Rumsey unfolds his scheme, and fully explains its details.

The second of these is occupied with the consideration of Education in the Healing and Health Preserving Arts. On this, however, as opening the whole question of "medical reform," we shall make but few remarks, the matter being now before Parliament, and receiving very ample discussion in other quarters. We observe that the author admires the autocratic form of government as much in this as in other departments of State medicine. The objections to State interference in medical questions are among the strongest arguments against particular measures of medical reform. We do not here enter upon the discussion, but we think most of our readers will, with us, demur to any governmental restriction of the admissions to the profession. This is unhesitatingly advised by Mr. Rumsey, in days when even all such close corporate restrictions in matters of trade have been found to have been wisely repealed. The author has altogether overlooked the fact that many of the greatest promoters of medical science have been those who, though members of the profession, have not been dependent upon daily practice. These men, therefore, if the supply were strictly limited by what a Government might suppose to be the demand, would be entirely excluded, or compelled to abandon the pursuit of the science for the drudgeries of practice. No greater mistake could assuredly be made than the introduction of State control of this kind.

In the third Essay we have an inquiry into the methods and defects of Sanitary Inquiry in England, and the directions in which it needs extension under State authority. The author first gives an historical notice of the opinions of Hippocrates, and Bacon's scheme, or 'Historia Vitæ et Mortis,' remarkable for "their singularly comprehensive character," and "their obvious connexion with present subjects and methods of research."

In commenting upon the modern statistical modes of inquiry, the author gives an instance of the misapplication of figures in an inquiry which took place a few years ago respecting workhouse dietaries, in which an altogether fallacious conclusion was arrived at by the omission of important data. We surmise, however, that some fallacy must lurk in the calculations upon which the author bases the conclusion (although he admits that the proof is not complete), "that the working classes, in

places where there are no gin palaces, notwithstanding their miserable dwellings and exposure to casualties, are longer lived than the affluent and luxurious." (p. 94.)

In this essay, Mr. Rumsey dwells upon defective sewerage, drainage, offensiveness of factories, defective structure of dwellings, intramural interments, and other allied topics, which have been so repeatedly brought under public notice during late years. The want of system in the collection and preservation of the information thus accumulated is pointed out by the author.

A just tribute is paid to the office of Registration of Births and Deaths, which by its energy, activity, precision, and civility, presents a 'striking contrast to every other board having to deal with public health, and with official boards in general. That there are still defects in the registration of births and deaths is not the fault of the registrar's department.

The total want of the means of ascertaining the amount of sickness prevailing during any period, is obvious to all; the construction of the machinery by which it shall be registered remains, and will, we fear, remain for some time longer, a *desideratum*. Until this shall be attained, our knowledge of industrial pathology, and of endemic and epidemic causes of disease, must be obscure.

The consideration of these topics leads to the fourth Essay, which treats of The Medical Care of the Poor in England, with notices relating to Ireland. This branch of his subject the author divides into two parts; first, the history of the rise and progress of Poor-Law medical relief; secondly, its present condition and requirements. These topics are too large for us to attempt to follow the discussion at this moment. We must be content to refer our readers to the author's account of these public institutions, and to an exposition of the Irish dispensary system published in a past number of this Journal (April, 1854). We must reiterate the wish there expressed, that a similar machinery for the State supervision of gratuitous medical relief could in this country be made to supersede our incongruous medley of infirmaries, dispensaries, and medical charities of various kinds, dependent upon uncertain or fluctuating voluntary contributions.

The fifth Essay, On Local Sanitary Administration, includes necessarily the consideration of the design and functions of officers of health. In discussing these, the author takes the opportunity to give an historical sketch of analogous appointments among the Romans and their European successors. The office of German *physicus* comes also under the author's notice, of which he remarks:—

"A succinct and intelligible description of the modern appointments of *kreis-* and *stadt-physicus*, and, indeed, of the whole medical polity in the different states of Germany, is still a desideratum in the literature of Hygiène." (p. 301.)

We trust that in a former part of this article we have given a succinct and intelligible account of the *kreis-* and *stadt-physicus*, but we take leave to doubt whether the English reader would be interested in the "whole medical polity in the different German states." German literature of hygiène possesses a most full and elaborate account of all these matters in the work of Rönne and Von Simon, quoted in our preceding remarks.

Mr. Rumsey dwells upon the attempts that have been made before the passing of the recent act, to obtain the appointment of officers of health. The imperfect operations of preceding acts are also pointed out. A high standard of qualifications for the duties of officers of health, is very properly insisted upon by Mr. Rumsey, and we fully concur with the author in his opinion that the functions of this officer are quite incompatible with the obligations and engagements of private practice—at all events, of the general practitioner.

The author deprecates the committing the local administration of sanitary measures to boards of guardians; and quotes from published reports instances in which these functionaries have thwarted the efforts of health officers, and obstructed measures for the prevention of the spread of epidemic disease. The metropolitan officers of health are no longer under the control of parochial guardians, but of vestrymen; the representatives of the French and German local boards. It remains to be seen whether these councils will entertain clearer and higher notions upon questions affecting the public health.

The last of Mr. Rumsey's series of Essays embraces several departments of health police, in their relations with local sanitary administration. These several departments are as follow:—

> "Registration of births and deaths; medical evidence in forensic inquiries; adulteration of food, drinks, and medicines; public vaccination; local organization of a civil medico-sanitary service; circuit inspection."

With regard to registration, Mr. Rumsey enforces the advantages that would result to science by the union of the registrar's with the duties of the sanitary officer.

The glaring defects of our coroners' inquests afford the author abundant reasons for urging the need of reform in our system of medico-legal researches. Mr. Rumsey also touches upon the question of the supposed superior qualifications of a medical man over a lawyer for the performance of the coroner's duties. This question we think, however, has been answered. It has been brought to the test of experiment by the coroner for the county of Middlesex, who obtained the appointment mainly by urging his medical claims, and who has himself appointed as his deputy, a member of the legal profession—his own son.

We have in a preceding page of these observations commented upon the imperfections of medico-legal investigation in this kingdom; we have shown the positive need of reform, and have urged that the appointment of a public prosecutor and medico-forensic experts to aid his investigation, offer the greatest amount of protection against the continuance of the present state of impunity to crime, ignorance, or carelessness.

The third department of which Mr. Rumsey speaks in his Essay, is that of adulterations of food, &c. The experiments and conclusions of Dr. Hassall are mentioned. Rigid inspection is recommended. Mr. Rumsey's observations upon the erroneous legislation which has thrown the preparation of the commonest articles of food into the hands of manufacturers, deserve notice. By removing restrictions upon the importation and distillation of spirits, the State has directly given rise to "gin palaces," the fountains of debauchery, disease, and death; while, at

the same time, by taxing malt, the practice of private brewing has been discouraged, and a wholesome, necessary beverage is exchanged for "liquid fire," that has branded disgrace and intemperance upon the lower classes, desolated their homes, degraded their wives and daughters. We entertain a hope that the remedy for these existing miseries will be so strongly urged by the future medical officers of health and British experts, that wiser counsels will prevail, and our legislators be led to retrace their steps. One condition, however, we hold to be essential to the usefulness of all efforts to extinguish fraudulent substitutions and adulterations of food—that is, that no exaggeration be admitted into the statements of adulteration; that due care be taken to distinguish between adulteration and preparation, or simply manufacturing processes. Such misrepresentations have been—doubtless, unintentionally—made; but caution should exclude them.

We come to the fourth topic, which the author here introduces to the notice of his readers—viz., vaccination. This is treated first historically, or an account is given of the establishment of the National Vaccine Institution, the only State provision for vaccination before the passing of Lord Ellenborough's Act of 1840.

Mr. Rumsey concurs in the objection taken by the Committee of the Epidemiological Society to this department of sanitary police being committed to the authorities for the control and relief of pauperism. It is obviously a matter relating to preservation of life—not of almsgiving.

Mr. Rumsey repeats the criticisms and imperfections of Lord Lyttleton's Act, as pointed out by the Epidemiological Society. These defects will, we hope, be in some degree remedied by the Amendment Act now before the legislature.

Mr. Rumsey objects to the three months' clause of the Vaccination Act, as advised by the committee of the Epidemiological Society. We hold, on the contrary, that this is a wise provision. The operation is thereby performed before the constitutional disturbances so commonly attendant on dentition have taken place; its course is therefore less liable to interruption. If the operation be delayed to the age of one year, it cannot be disputed that a large proportion of infants would be left open to the attacks of a specially formidable infantile disease. On the other hand, no valid objection is urged against the early period. Prejudices should not be admitted as arguments, else where would be vaccination at any age? We anxiously await the appearance of the second division of the Report on Small-pox and Vaccination, by the Epidemiological Society, which promises therein more strictly pathological data than were called for in a legislative measure, to which statistics were deemed the more essential.

Mr. Rumsey objects to the principle of compulsion—so do others; but the majority of those members of the profession who took the trouble to answer the queries of the Epidemiological Society, approved the principle as offering the only chance of efficient legislation; we have little faith in the march of intellect, after so lamentable an exhibition of ignorance as that which took place not long ago in the British House of Commons in connexion with this question.

Mr. Rumsey proceeds to discuss the several features of the two Bills

now before Parliament. We trust that the important department of Vaccination will not be separated from other sanitary regulations.

The next section, on Health Officers, does not call for observations beyond what have already been made in this and a preceding article.

The last section recommends the very requisite inspection of all public medical institutions and sanitary offices, by superior inspectors. With regard to the importance of this measure we apprehend there can be no difference of opinion; the difficulty will be in the selection of officers, and the definition of their functions.

Mr. Rumsey's volume concludes with "Supplementary Notes" to the several subjects in the body of his work. One of these requires notice. The scheme of providing nurses for the sick poor, from among the inmates of workhouses. Mr. Rumsey thus criticises the proposition:—

"It is, however, to be regretted, that its humane and learned originator and promoters were not more practically acquainted with the class out of whom they propose to make nurses, and that, before promulgating a specific plan, they had not more extensively consulted the chaplains and medical officers of workhouses. Even by this time they may have learnt, that the training, habits, notions, and associations of female paupers, as a class (for there are exceptions, of course), are such as to render them most unfit for an employment in which the strictest decency, cleanliness, and morality, with some delicacy of feeling, are essential to the welfare of the patient." (p. 411.)

Mr. Rumsey has overlooked the first principles and most essential feature of the proposed scheme, consisting in the *training* and *educating* of the female inmates of workhouses for the duties of nursing, under the direct supervision of medical and other officers.

From some experience among the poor, we cannot concur in Mr. Rumsey's objections to the *class* of paupers. We entertain much stronger objection to the formation of institutions of "Nursing Sisters" or organized "Sisterhoods," as fraught with dangers not always obvious to the casual observer.*

We would add, in conclusion, that Mr. Rumsey has done good service to the present sanitary movement, by bringing together in an accessible form a connected account of the dissociated and heterogeneous mass of legislation, and private efforts, in the direction of Hygiène and State Medicine. His work may be fairly said to represent the first chaotic stage incidental to all great popular movements; at the same time that it marks our arrival at a period of order, and the accomplishment of some of the designs, hitherto but vaguely conceived.

Review VIII.

On Calculous Disease and its Consequences. Being the Croonian Lectures for the year 1856, delivered before the Royal College of Physicians, by G. Owen Rees, M.D., F.R.S., &c., &c., Fellow of the College, Assistant Physician and Lecturer at Guy's Hospital, Examiner on Materia Medica in the University of London.—*London,* 1856. pp. 81.

The profession are already familiar with some of the tenets advocated by Dr. Owen Rees, in the Croonian Lectures delivered before the College of Physicians during the present year. He has recently published, in the 'Guy's Hospital Reports,* a paper, in which he contests the opinion of Dr. Prout regarding the existence of a phosphatic diathesis, the symptoms indicating which he explains by the precipitation of earthy phosphates from acid urine by the *alkaline* fluid poured out by the inflamed urinary mucous membranes. This view is still further developed in the present lectures. Their chief object is to prove that the excessive formation of uric acid is the efficient cause of the great majority of all calculous disorders. Dr. Rees commences with the consideration of oxaluria, and adverting to the facility with which urates and uric acid are converted into oxalates, goes through a series of Dr. Golding Bird's cases, in order to prove that the so-called oxalic acid diathesis is nothing more "than an accidental and unimportant modification of the uric." That a conversion of uric acid into oxalic acid may and does take place after the urine has been discharged, cannot be doubted. We are of opinion, from microscopical observation, that the converse may also occur, and that oxalic may be transmuted into uric acid. But may this change of uric into oxalic acid occur where no urates are seen in the urine? in short, may the conversion have been effected previous to its discharge from the body? Dr. Rees, in answer to this question, makes the following remarks:

"Let us first consider whether we do not occasionally observe severe symptoms in cases characterised by a deposit of urates, identical in kind as well as degree with those observed in oxaluria; and whether, again, we do not occasionally observe in oxaluria an almost entire absence of symptoms, or symptoms of trivial character and identical with those most frequently noticed, where the lateritious sediment prevails.

"On the first point I would observe that nearly all dyspeptics pass urates, and that the severest symptoms of hypochondriasis are to be met with in such cases, without the oxalates necessarily appearing in the urine. On the second point I can most confidently state, that I have had cases under my care in which the excretion of oxalate of lime has gone on even to the production of calculous disease, in which hypochondriasis and irritability have never been prominent symptoms. I have, in fact, entirely failed to detect the peculiar pathological conditions which have been said to connect themselves with the oxalic acid diathesis, and am every day more confirmed in my opinion that it must be regarded, as I have before suggested, as an accidental and unimportant modification of that most significant variation from health which consists in the excretion of uric acid or its compounds in abnormally increased proportion." (p. 8.)

Dr. Rees' experience with regard to the occurrence of oxaluria as a prominent symptom in gout, is confirmatory of the above view; and he suggests that the reason why the connexion between gout and oxaluria

* British and Foreign Medico-Chirurgical Review, April, 1856, p. 317.

has so long remained unknown, is because the oxalate of lime constantly escapes notice, whereas the uric acid deposits are obvious to the patient.

If we admit the formation of oxalates from urates, the uric acid diathesis may be regarded as the chief source of calculous disease, since phosphatic calculi are but rarely met with without a nucleus of a different character, which by its irritation gave rise to the deposit of phosphates (upon Dr. Rees's theory) from the alkaline secretions of the mucous membrane of the urinary passages. When pure phosphatic calculi are met with—

"They are only observed in cases where the mucous membrane of the bladder has become greatly diseased, and where of necessity we have the alkaline secretion poured out from it in quantity. This state of things, as is well known, often follows upon enlargement of the prostate with stricture, so that the bladder is not easily emptied; portions of urine always remaining in the bladder after micturition. These retained portions will have their earthy phosphates precipitated by contact with the alkaline secretion of the diseased mucous membrane. In this state of matters it is easy to imagine how a calculus may form." (p. 25.)

A case of eversion of the bladder is quoted in confirmation of the fact that the secretion of the vesical mucous membrane when inflamed has the power of rapidly rendering the urine alkaline. In that case the fundus of the bladder projected so as to expose the orifices of the ureters.

"The mucous membrane was red and inflamed from exposure, and alkaline fluid was constantly discharging from its surface. To what this alkaline flux amounted during the day it was of course impossible to ascertain; but it was more than sufficient to destroy the acidity of the urine, which was quite alkaline after flowing over the membrane."

Blue litmus paper applied to the mouth of a ureter was reddened, but even at the distance of a quarter of an inch below the opening, the urine had become sufficiently alkaline to restore the blue colour of the paper.

Dr. Rees applies his theory to the formation of calculi in the bladder and in the kidney; but however we may be inclined to adopt the views of which we have given the above summary, we think the author fails to establish his point with reference to the kidneys. After remarking that the alkaline secretions of the bladder are necessary and sufficient by their chemical action to cause the precipitation of calculous matter in the bladder, he observes that analogy justifies our assuming the same process to effect the formation of calculi in the kidney. For fear of being misunderstood, we quote the author's words:

"A moment's reflection will serve to show that we have the same conditions present in the kidney which we have noticed with regard to the bladder; that is to say, we have urine, and a mucous surface with which the urine comes in contact, and analogy points to its secretion possessing the same chemical qualities."

If the analogy held good, we ought to find the urine alkaline whenever the kidneys were subjected to irritating or inflammatory influences; but the reverse is the case, the secretion presenting a greater amount of acidity under those circumstances than in the healthy state. Dr. Rees dwells upon the desquamation of the renal epithelium which occurs in some forms of nephritic irritation, as favouring the production of calculus, by entangling the lithic acid, or lithates, which are the prominent constituents of renal calculi. But though willing to admit the influence of

the renal epithelium in entangling and causing a further enlargement of small portions of lithic acid after they are eliminated from the urine, such mechanical action can scarcely be compared to the chemical properties so well urged by the author as characterizing the secretions of the vesical mucous membrane.

Whether or not we adopt the author's theory with regard to the formation of renal calculi, his remarks on the symptoms and consequences of this disorder are of much interest. We advert specially to his observations on the subject of calculi becoming encysted in the kidneys. In certain cases marked by all the symptoms of renal calculi, severe pain in the loins, sides, and abdomen, nausea, vomiting, and hæmaturia, there is *sudden* relief, attributable to the passage of the calculus from the kidney to the bladder; in others, the relief from pain is *gradual*. Patients—

> "Who suffer in this way are apt to have a return of symptoms after a day or two, and are restored to health only after a series of attacks. It is often difficult to persuade them that there can be anything in their kidney; and after a year or two of impunity, they will hint that a mistake must have been made in their case. They are not likely to be satisfied with less than the production of the stone, if they have once heard of it; and this may only see light on a post-mortem examination, and therefore too late to produce a modification in their opinion. When treating such cases, the practitioner had best explain at first the relief of symptoms which may probably take place by the calculus becoming encysted—a termination, I have reason to believe, not always sufficiently expected by the profession." (p. 40.)

The renal calculus which appears to give rise to the least amount of suffering, and is often characterized by hæmaturia only, is the oxalate of lime variety, which, from the constant draining of blood, with the absence of pain, is apt to induce a belief that the patient is suffering from malignant disease. Dr. Rees admits the difficulty, which must have occurred to many physicians, of arriving at a correct diagnosis in a case of this kind. The microscope may not show anything in the urine beyond the blood-corpuscles. In malignant disease of the kidney, it is by no means necessary that corpuscles characteristic of malignant growth should be visible. In cancerous growth affecting the bladder, we are more likely to meet with

> "Cells characteristic of malignant growth. These, which are intimately intermixed with the blood-corpuscles, have an appearance unlike that of any ordinary matter deposited from the urine. These cells are of variable size, the smaller being about four times the diameter of a blood-corpuscle; the larger twice that size, and even of greater diameter. They are colourless, and more transparent than the white corpuscles of the blood, and contain within them nuclei of varying size. These nuclei differ in number in each cell. Sometimes one only is present, sometimes four or five. Though there would appear a general tendency on the part of these bodies to assume the circular form, they are for the most part of irregular outline. Sometimes a mass of them may be seen agglutinated together, and then they are more or less square, or they may approach to the hexagonal form. After many years' experience in the examination of urinary deposits, I can affirm that I have never seen corpuscles like these in the urine, except in cases of malignant disease." (p. 52.)

Dr. Rees lays much stress, and properly so, on the importance of a correct diagnosis of the cause of hæmaturia, more particularly with the view to preventing the undue introduction of instruments.

"It is not a very unlikely supposition that deaths are every year accelerated, and perhaps sometimes absolutely produced, by sounding in cases of malignant disease of the bladder, morbus Brightii, and renal calculus."

In speaking of cystitis connected with vesical calculus, as liable to induce the assumption of its presence, Dr. Rees expresses a doubt as to the existence of an idiopathic disease of that kind altogether. We are satisfied that at least catarrhal inflammation of the bladder ought not to be eliminated from our nosological classifications as a mere fiction; but then, this affection, like catarrhal inflammation of other mucous membranes, is not one likely to be met with in the post-mortem examination.

On the subject of hæmaturia as a symptom of disease in the urinary organs, the author offers several important practical suggestions. He doubts the occurrence of idiopathic hæmorrhage, and regards it solely as an indication of deeper-seated disease of the kidney or the accessory organs. The main questions that arise in the case of hæmaturia depending upon disease of the kidneys, affect the presence of calculus in the organs of Bright's disease, or of malignant growths in the kidney. The presence of albumen when the urine is not tinged by blood, is stated to be a sufficient indication of the presence of Bright's disease.

"If, however, the urine, on becoming of its natural colour after an attack of hæmaturia, does not prove to contain albumen, then we may feel nearly sure that the hæmorrhage proceeded either from a calculus in the kidney, or some malignant disease of the organ."

With regard to the diagnosis of Bright's disease, if we may still include all forms of chronic albuminuria under one term, we would observe, first, upon the comparative rarity of hæmorrhage as a symptom, and, secondly, upon the importance of certain well-known microscopic characters to which Dr. Rees does not even advert, and which consist in the presence of renal epithelium and the epithelial or fibrinous casts of the renal tubules. The diagnosis between hæmaturia dependent upon calculus or malignant disease of kidney, is summed up under the following heads:

"1. In malignant disease the blood is generally passed in larger quantity than in calculus of the kidney.

"2. There is more frequent tendency to nausea *on slight occasion* than in calculous disease.

"3. Microscopic examination of the urine will frequently show pus or mucus in excess, if there be calculus; whereas in malignant disease this sign does not so frequently exist.

"4. The appearance of those suffering from malignant disease of the kidney, is nearly always indicative of a state of anæmia more or less advanced.

"5. In calculus, hæmaturia generally follows upon some unwonted exertion.

"6. Careful examination of the abdomen will frequently lead to the detection of tumour, if there be malignant disease of the kidney." (p. 64.)

Our readers will infer from the account we have given of Dr. Rees' views relative to calculous disorders, that his treatment consists mainly in the exhibition of alkalies, with the intention of rendering the urine alkaline as secreted by the kidney. He especially recommends for this purpose the citrate of potash in the effervescing form. For the relief of the violent pains attending renal calculus, he approves of the administration of opiates; and in severe hæmaturia, he gives the acetate of lead as the drug possessing the greatest power in controlling and arresting the sanguineous flux.

Review IX.

1. *Lectures on the Diseases of Women.* By Charles West, M.D., Fellow of the Royal College of Physicians, &c. &c. Part I. *Diseases of the Uterus.*—*London*, 1856. 8vo, pp. 413.

2. *A Review of the Present State of Uterine Pathology.* By James Henry Bennet, M.D.—*London*, 1856. 8vo, pp. 99.

Those who have benefited by the study of Dr. West's excellent work 'On Diseases of Children,' will doubtless welcome another work by the same author. Nor will they be disappointed; for although the same amount of originality could not reasonably be expected, the present volume possesses very solid merits of its own. It is remarkably well written, its style is easy and flowing, and the form of lectures divests it of formality, and permits a familiarity of observation which facilitates the communication of information. Moreover, Dr. West has brought to bear upon the diseases of the uterus all that increase of pathological knowledge which minute and careful investigation, aided by chemistry and the microscope, has so strikingly developed within the last few years. On the other hand, the volume has hardly the comprehension and completeness of a systematic treatise, and although the practical part sufficiently reflects the author's experience, it might have given more fully the recorded experience of others.

The present volume is only a portion of the entire work: it embraces diseases of the uterus, including disorders of menstruation, hypertrophy and inflammation of the uterus, displacements, polypus, fibrous growths, and cancerous diseases. Fully appreciating the great value of the views put forth, we shall endeavour, as far as our space permits, to give the reader a short sketch of Dr. West's opinions upon most of these subjects.

The first two lectures are introductory, and occupied with the general consideration of female diseases, their symptoms, &c., illustrating, amongst other things, the mistake of regarding them merely as local affections on the one hand, or, on the other, of attributing them always to a constitutional origin; whereas they are sometimes one and sometimes the other, and not unfrequently a compound of both. The author next dwells upon the three modes in which diseases of the uterus show themselves—viz., in disordered function, alteration of sensibility, and change of texture; and he lays down at some length, and very judiciously, the appropriate modes of investigation. Manual examination, external and internal, with ocular inspection, are the only means of ascertaining organic changes, and we are glad to find Dr. West dwelling strongly upon the value of the former, which seems to us to have been rather under-estimated since the employment of the speculum has been so general. In Dr. West's favourable opinion of the uterine sound we also concur, provided that it be employed in suitable cases; and also that—

"In the majority of cases, its introduction causes some pain, though this is generally by no means severe, and is almost always of very short duration; and in no instance which has come under my observation have dangerous consequences

resulted from its use, though awkwardness and foolhardiness have, I know, done mischief with this as with almost every other instrument that has ever been invented." (West, p. 17.)

Dr. West's estimate of the practical value of the speculum is not so favourable as that of many recent writers, and although we agree with him in thinking that some of the topical applications for which it has been employed have been overrated, yet we must admit that there are others of great importance in the application of which the speculum is most useful. As a help in diagnosis, he

"Thinks that the advances in knowledge of uterine disease, of which it was the indirect occasion by the impulse which it gave to their study, are sometimes confounded with those positive additions to our information which we owe exclusively to the use of that instrument. The former have been very great indeed; and I think candour compels us to acknowledge, that they have been due almost exclusively to persons who, not content with our previous means of investigating uterine disease, have laboured to increase them by the employment of instruments. The latter have certainly been less considerable, but, nevertheless, the speculum enables us, in many instances, to decide at once and with certainty upon the nature of a case which otherwise we should only have understood after long and careful watching; to discern some minute polypus, which the finger alone would not have detected; to determine the source of a profuse leucorrhœal discharge, and to decide whether it is furnished by the cavity of the womb or the walls of the vagina; or from the redness, congestion, or abrasion of the os uteri, to infer the state of the womb generally; and thus to conduct our treatment upon the sure ground of positive observation, not upon bare presumptions. At the same time, however, that I hold the speculum to be, in many cases, of most essential service, I think that the endeavour of all of us should be, to ascertain the minimum of frequency with which its employment is necessary. This is to be done, not by decrying the instrument, still less by attributing dishonest motives to those who use it, but by soberly and honestly trying to test the information which we derive from it, and learning to discriminate between those appearances which the speculum discloses that are of moment, and such as are of no importance." (West, pp. 23, 24.)

Lectures III. and IV. are occupied with the disorders of menstruation. The description of the different varieties is very good, but, as we might expect, there is nothing new advanced. When speaking of the local causes of amenorrhœa—such as absence of the ovaries and uterus, &c.—the author relates two cases in which he had reason to suspect that the former organs were wanting; but he observes that, during life, we can only *infer* this to be the case by comparing the history and symptoms with those of other cases in which post-mortem inspection has demonstrated their absence. The remarks upon the first occurrence of menstruation, its delay, or the substitution of a white discharge, are practical and judicious. In treating cases of amenorrhœa, allowance must always be made for natural variations and disturbing causes, in which little or no interference is necessary; but after eliminating these, there still remains a considerable number who may be benefited by our aid, and these Dr. West divides into two classes—the plethoric and anæmic, and the treatment must vary accordingly. When there is no local effort, our object is to strengthen the system by tonics, mild pure air, &c., and to guard as far as possible against cold, remembering how liable this class of patients is to phthisical attacks. If there be any uterine effort, we must try and aid it by hot hip-baths, stimulant diuretics, iron, &c. Electricity has occasionally succeeded,

but its effects are uncertain. Ergot has failed, as might have been anticipated; and as to more heroic means, we quite agree with Dr. West, when he says that

"All violent measures, such as the administration of cantharides or of the oil of savin, in large doses; or very powerful local stimulants, such as vaginal injections of liquor ammoniæ, mixed with milk; or the introduction of nitrate of silver into the uterine cavity by means of Lallemand's *porte caustique*, appear to me to deserve reprobation, as both uncertain and unsafe." (West, p. 43.)

Menorrhagia is classified, according to our author, according as it depends upon—1. Some general constitutional cause; or 2. Some affection of the sexual system. Among the former are enumerated, the effects of certain climates; an altered state of the blood; irregularities of circulation, especially in the decline of life; certain diseases of the liver and other abdominal organs, &c. In such cases, however, when persistent, a secondary change takes place in the uterus. Among the causes which act primarily upon the uterus, are all those which produce excitement and congestion of that organ or the ovaries—such, for example, as excessive or incomplete sexual intercourse. Dr. West, we think, is the first to notice the ill effects of the latter, and our own experience amply bears out his statement. The indications of treatment in menorrhagia are, of course, to arrest the hæmorrhage, and to remove its cause. Tonics, regulated diet, rest in the horizontal position, astringents when the hæmorrhage is passive, and bleeding or leeches if there be general febrile disturbance, are the remedies upon which Dr. West relies. He enumerates four special astringents—viz., gallic acid, matico, alum, and lead: in the two former he has the most confidence. We are rather surprised at the very qualified approbation of ergot of rye expressed by Dr. West, as we have generally found it very effectual. Indian hemp, which we can also strongly recommend, does not seem to have been tried by him. Digitalis has been less effective in his hands than in those of Mr. Dickinson and Dr. Lee. External irritation by a blister, which is sometimes so beneficial, is not mentioned; but he relates a case in which, as a *dernier ressort*, he injected gallic acid into the uterine cavity, without causing pain or subsequent inflammation, and with the effect of arresting the discharge.

Dysmenorrhœa is divided into neuralgic, congestive, and mechanical; and the description of each variety is very accurate. Dr. West adopts Dr. Simpson's view of the nature of the dysmenorrhœal membrane, that it is analogous to the decidua, both being the mucous membrane of the uterus, modified and exfoliated. It may possibly be so, but the evidence for either is hardly conclusive as yet.

We are inclined to agree with the author, that the frequency of mechanical dysmenorrhœa has been overrated; but when it does exist, he prefers dilatation by metallic bougies, or a small sponge tent, to a division of the stricture by the *bistouri caché*; of which he remarks:

"I am perfectly at a loss as to the principle on which these instruments are recommended. If the cervix (os) uteri be wide enough to admit them, I do not see how its narrowness can be a mechanical impediment to the escape of the menses. I can, however, readily understand that the uterus may suffer severely from the violence offered to it; and, indeed, have known pelvic abscesses succeed to some of these manipulations." (West, p. 86.)

The next subjects to which our attention is directed are, hypertrophy and acute inflammation of the uterus; and to Dr. West's observations upon the former of these affections, we would particularly direct the reader. That form of hypertrophy dependent upon deficient involution of the uterus, and which we believe was first pointed out by Dr. Simpson, is here shown to have a very important practical bearing: in fact, that many cases which have been regarded as dependent upon recent changes, and for which it is difficult to find a cause, may be traced back to a distant confinement for their solution. We feel no doubt that this will, in future, enter more largely into our calculations as to the origin of uterine disease. Dr. West regards pregnancy and delivery, prematurely or at the full time, as among the most common exciting causes of diseases of the sexual organs; and if to these we add menorrhagia, we cannot hesitate to agree with him. Hypertrophy may undoubtedly result from inflammation after delivery; and—

"It must, however, be at once apparent that, after inflammation has passed away, its effects may remain in the larger size and altered structure of the womb; and that the very nature of these changes will be such as to render the repair of the damaged organ both unlikely to occur and slow to be accomplished, and must leave it in a condition liable to be aggravated during the fluctuations of circulation and alternations of activity and repose to which the female sexual system is liable. It must also be obvious that, for these results to be produced, it is by no means necessary that the inflammation be very severe in character, but that a degree of inflammatory action, far short of what is requisite to endanger life or to occasion much suffering, may yet interpose a great obstacle to the complete involution of the womb." (West, p. 92.)

There are few, probably, who have not met with cases of this kind; and when of long standing it is often very difficult to trace them to their origin, or to decide whether the hypertrophy is an active increase, or an arrested decrease of the organ. The symptoms are chiefly mechanical, and due to the size and weight; the patient complains of fulness and weight in the pelvis, and a degree of bearing down; but there may be also excessive menstruation and a good deal of pain. The condition of the organ will be detected by an internal examination.

But besides this species of hypertrophy, we undoubtedly meet with cases in which it is due to a growth in size, although it may be difficult to explain the exact nature of the morbid process. Dr. West remarks of such cases, that he has met with them "exclusively in women who have lived for a longer or shorter time in childless marriage;" and that they

"Present themselves in most instances without any definite clue to their history; sense of weight in the pelvis; pain, usually of a burning character; and hæmorrhages having gradually come on, and forced themselves by their slowly increasing severity (sometimes not till after the lapse of years) on the patient's notice. Excessive or intemperate sexual intercourse does not produce it, though that leads to its own train of evils; but there has, in many instances, seemed good reason for associating the condition with the imperfect performance of that function, and sometimes the evidence of that being the case has been conclusive." (West, p. 94.)

Rest, attention to the bowels, local leeching at intervals, with the internal administration of iron, with iodide of potassium, seem to be the remedies which Dr. West has found most useful. We may add,

from our own experience, the application of strong tincture of iodine over the cervix, and the use of the medicated pessaries of iodine or hydriodate of potash.

After describing acute inflammation of the unimpregnated uterus, Dr. West proceeds to treat of the *quæstio vexata*, chronic inflammation and so-called ulceration of the cervix uteri. On the publication of his Croonian Lectures, we laid his views pretty fully before our readers, so that there is no occasion to repeat them now. We shall merely state that the chapter On Chronic Inflammation of the Cavity and Substance of the Uterus, has given a degree of completeness to Dr. West's views, as well as afforded an opportunity of explaining some of the symptoms common to ulceration and other affections, which was felt as a *desideratum* in his former work. Taken altogether, although there remains a considerable difference between the views of Drs. West and Bennet, we think there has been really an approximation.

Dr. Bennet has also, it appears to us, not modified perhaps, but guarded his opinions more carefully in the little work which we now introduce to the reader's notice. The same pathological views are maintained, but the limits and qualifications and checks are more prominent. The work is altogether of a controversial character, in answer to various attacks which have been made upon his larger work, but controversies conducted in such a spirit are of advantage both to the writer and the profession at large. Dr. Bennet's personal opponents are Dr. Lee, Dr. West, and Dr. Tyler Smith. By the aid of Dr. West's Reports he disposes of Dr. Lee very satisfactorily, and then takes up the cudgels against Dr. West's assertion, that although ulceration or erosion is more frequent than some have supposed, yet that it is of little pathological significance, neither giving rise to the symptoms attributed to it, nor requiring peculiar local treatment. In answer to which, Dr. Bennet repeats his former opinion, but lays great stress upon the ulceration being caused by, and coincident with, chronic inflammation, to which he attributes the local and general symptoms. He considers this inflammation to commence in, and to be ordinarily confined to, the cervix-canal or substance; whereas Dr. West conceives the lining membrane of the cavity to be the starting point.

In opposition to Dr. Tyler Smith's opinion, that the primary cause of the erosion and consequent symptoms is a morbid secretion from the cervical canal, he maintains that the local characteristics are those of inflammation, and that the increased or depraved secretion is a secondary consequence; and, in many cases at least, we are inclined to decide in his favour.

After these personal encounters, we have a detailed examination of the "leucorrhœal theory, the syphilis theory, the ovarian theory, and the displacement theory," which have each been set up in opposition to Dr. Bennet's views, and as an explanation of the class of cases to which he has especially directed attention. We strongly recommend this part of the work, as possessing great interest and treated with great ability. His remarks upon displacements we think particularly good. Our space forbids us to do more than extract the conclusions at which he arrives:

"Thus cases may and do occur in which inflammatory lesions of the neck of the uterus, including ulceration, exist without presenting any pathological im-

portance. In some women, the organic sensibility of the womb, and its sympathetic connexion with the rest of the economy, are so slight, that severe uterine disease, inflammatory or other, may exist for months or years—as in other organs—without producing much local discomfort, or much general disturbance; but these are exceptional cases. To conclude from them that inflammatory lesions in this region are, as a general rule, of no pathological importance, is to state what is, on the one hand, contrary to experience, and on the other, contrary to the laws of general pathology to which I have so often and so confidently appealed in the course of this review.

"Thus leucorrhœa often exists as a mucous membrane and follicular hypersecretion, the result of physiological or pathological congestion, and may in some rare cases exercise a morbid reaction on health, and require treatment. But to consider this hypersecretion as the essential disease that generally produces the symptoms of uterine ailment, local and constitutional, and to look upon the recognised inflammatory lesions and reactions of uterine mucous membrane as mere symptoms of this essential disease, is to ignore utterly the laws of general pathology. It is indeed to mingle together, in inextricable confusion, the cause, nature, symptoms, and sequelæ of uterine disease.

"Thus ovaritis exists both in the acute, subacute, and chronic forms, and when it is present reacts of course on the uterine functions, giving rise to a regular sequence of symptoms; but to attribute to subacute ovaritis the cases in which tenderness, pain, and fulness of the ovarian region are found, and to look upon the co-existing uterine lesions and symptoms as merely sympathetic conditions, is simply a pathological error, the result of pathological prepossessions. It is giving to the ovaries, pathologically, the same pre-eminence in the female genital system that they really do exercise physiologically—a pre-eminence to which they have no real claim.

"Thus primary and secondary syphilis are both observed in the neck of the womb; but their presence is, in reality, so rare, that even in the wards of a syphilitic hospital they are seldom observed, and they have very little to do with the uterine disease observed in town practice.

"Thus displacements of the uterus are constantly met with; but, except in extreme cases, they are in reality of secondary importance. They often exist in the healthy without being recognised or complained of; and they often remain after the removal of disease without distress or inconvenience being experienced. Whilst in those who suffer from uterine ailment they generally coexist with decidedly inflammatory lesions, their presence may be generally explained by these lesions; and they generally disappear by degrees, as the inflammatory lesions are cured and removed." (Bennet, p. 81.)

In a controversial point of view, Dr. Bennet has attained a considerable measure of success. If his theory has its weak points, its too sweeping and exclusive generalization, so that we cannot always quite agree with him, he has certainly shown that this equally applies to his opponents, and that certain of them have much slighter foundation for their conclusions. But the lesson we should all learn from these controversies, is the danger and evil of one-sided opinions; of adopting a theory, and trying to explain all cases on that hypothesis, instead of admitting the manifold character of disease, and endeavouring to add to our knowledge by more extended observations.

Let us now return to Dr. West's volume. The description of the way in which prolapse and procidentia of the uterus is produced is one of the best in the English language. In it Dr. West follows the late Professor Kiwisch, whose eminence is unquestioned here and on the Continent. He agrees with the highest modern authorities in attributing much more importance to the vaginal supports of the uterus, in preventing its descent,

than to the so-called ligaments. But when all the supports have been relaxed by abortion or childbearing, or even by long-continued leucorrhœa, if at the same time the uterus be larger or heavier than natural, from disease or deficient involution, then a gradual depression takes place, which in time may result in prolapse, or even in procidentia. But this is not all, for the same mechanism involves, according to Dr. West, a certain amount of retroversion in all cases of prolapse. And, moreover—

"This misplacement of the womb does not happen, or at least occurs comparatively seldom unaccompanied by other alterations both in the organ itself and in the surrounding parts. The womb, subject to constant and unusual irritation, obeys the law which we observe to be exemplified in almost all the affections to which it is liable, and increases in size by a process of simple hypertrophy, which differs from the enlargement of pregnancy only in the somewhat greater density of the tissue. The neck of the womb is the part in which this alteration chiefly takes place; for it is the neck which is exposed to the most and the most constant irritation. This enlargement, too, occurs both in length as well as in thickness; so that the neck of the womb may not only be found nearly of the thickness of the wrist, but also greatly elongated, and the os uteri be thus approximated to the pelvic outlet, not simply by the general descent of the womb, but also in great measure by positive growth of its neck. The lips of the uterus become enlarged, together with the rest of the womb, and the small transverse aperture which in women who have borne children should represent the orifice of the womb, becomes converted into a wide opening, situated deep in between the projecting lips, whose surface, irritated and excoriated, presents, in parts at least, a vivid red, finely-granular surface, covered by a copious albuminous secretion." (West, p. 156.)

Thus increased in volume and weight, with relaxed and yielding supports, the progress of the case is pretty certain, though slow, if it be not quickened by some sudden exertion or force acting down upon the pelvis, which is most probable; and this downward course is traced with great accuracy by Dr. West, who also describes with great care the secondary displacements of the vagina and bladder. He seems doubtful as to the first step in vaginal cystocele—that is, whether the protruding vagina draws down the bladder, or the distended bladder pushes before it the vagina. Judging from the cases which have come before us, we think that the latter is the ordinary course, as also that the first step in vaginal cystocele is over-distension of the rectum; although, perhaps, in both we may presume a degree of undue relaxation in the supports.

The symptoms to which these displacements (by the way, we are inclined to quarrel with Dr. West's substitution of the word misplacements for the older and better one) give rise are very well described, as well as the information to be acquired by sight and touch. In the treatment recommended, there is an important practical distinction, to which we would draw attention:—

"Sometimes the prolapsus is the result of causes which add to the weight of the uterus, and thus render its ordinary supports unequal to maintain it in its proper position, while in other instances a weakening of the supports themselves by accident or disease is the first step towards producing the misplacement; and according as the one or the other of these conditions predominates, will the use of mechanical means be expedient or undesirable. Thus, for instance, time and care, and judicious management, generally suffice to remove that form of descent of the womb which succeeds to miscarriage or labour, whereas the as yet imperfect

involution of the organ, and its consequent increase of weight, are the main causes of its misplacement, while mechanical contrivances are always needed when the support which the vagina should afford has been destroyed by extensive laceration of the perineum or greatly enfeebled by the atrophy of old age." (West, p. 174.)

We quite agree with this passage, but we would also apply the same rule to those cases in which the depression is the result of removable disease, unconnected with delivery.

Of the various contrivances to afford mechanical support, Dr. West seems to prefer the globular or disc pessary of boxwood, and he speaks rather favourably of the india-rubber bags, which are introduced empty and inflated afterwards by a tube attached to them. He speaks very satisfactorily of Dr. Ashburner's bandage, and indeed of Hall's utero-abdominal supporter, and especially as to the relief afforded from the sympathetic pains. He does not give much encouragement to operative proceeding, having known but little benefit either from closure of the outlet, diminution of the calibre of the vagina, or the entire removal of the uterus.

The mechanism of retroversion of the womb has been partially alluded to, and the reader will find it very satisfactorily described by our author. We should have liked to see some statement of his opinion, however, as to its normal mobility. We believe this to be considerable, and we suspect that some cases which have been pronounced and treated as such were within these limits. We agree in this with Dr. Bennet—

"That even the unimpregnated uterus, in health, is by no means destined to remain constantly in the same anatomical position, to preserve constantly the same axis. It is also equally evident that the healthy uterus bears changes of position and considerable pressure from surrounding organs, &c., without either pain, discomfort, or inconvenience."

Abstracting these cases, however, modern researches have shown that these versions or flexions of the unimpregnated womb occur as a morbid state much more frequently than was suspected. The passive conditions, as we may call them, are a relaxed condition of the supports of the uterus, and a certain amount of depression; if, then, in addition, the fundus of the uterus acquire additional weight posteriorly, we have all the necessary conditions of retroversion; or if the weight be anteriorly, of anteversion. The actual completion of either displacement may occur gradually, without consciousness or distress, or in consequence of sudden force the process may be momentary.

We concur with Kiwisch and West, that it is difficult to understand how such a displacement as anteversion can occur in an otherwise natural condition of the womb, nor have we had reason to believe it frequent. It may, however, be produced by disease of the anterior wall; but these cases are rare, and Dr. West thinks that "the probabilities are that in most instances when the uterus has been supposed to be anteverted it was in reality anteflexed, or its fundus bent forward on its cervix, or else that the indurated and enlarged uterus was tied down in its position by old adhesions." Indeed, if we consider the connexions of the uterus anteriorly, it is not quite easy to understand the occurrence of anteflexion. The point of flexion, whether anterior or posterior, appears to be the junction of the cervix and body, and Virchow's explanation is the one

preferred by Dr. West. Our suspicions may be aroused by a digital examination, but it will be difficult indeed to decide between retroflexion and a tumour of the posterior wall, unless we are able to employ the uterine sound. The treatment will vary according as we decide with Schweighauser, Schmidt, and Oldham, to attempt the removal of the cause in the first instance, or content ourselves with remedying the displacement mechanically. The former is at least the most philosophical proceeding. After enumerating some objections to the stem pessary, Dr. West thus states his own plan:

"On these accounts, though I have tried the uterine supporter in a few cases, I have now for some time quite given up its employment, and content myself with a mode of treatment which, though it seems to promise less, yet almost always affords great relief, which in a large number of cases quite removes the patient's sufferings, and is not unfrequently followed by the complete rectification of the position of the womb. The principle, indeed, upon which I act in the management of these cases amounts pretty much to this: that to the best of my power I take care of the general symptoms, and leave the misplacement to take care of itself. (West, p. 225.)

We must slightly qualify our agreement in Dr. West's plan of treatment: we have certainly found, as he has, that when the enlarged condition which causes the displacement is removed, the uterus will, in most cases, resume its proper position; but we have also found that in a few cases this re-position did not take place, and that certain inconveniences were the consequence, which were capable of being removed by mechanical support. This we have afforded, not by Dr. Simpson's stem pessary, but by one made of gutta percha, which acts on the principle of distending the vagina upward behind the uterine neck.

In addition to the local remedies mentioned by Dr. West for the removal of that condition which causes the displacement, we may mention that we have found great benefit from the local application of iodine.

Lecture XIII. is devoted to the consideration of inversion of the uterus, either as occurring after labour, or as a chronic complaint, in which its mode of production, causes, symptoms, and treatment are fully discussed; but as Dr. West's views do not materially differ from the standard authorities, we need not detain the reader, but shall pass on to the subject of polypus uteri. Under this term Dr. West includes mucous, cellular, glandular, cystic, and fibrous polypi, and he has given a remarkably clear description of each. All give rise to nearly the same symptoms, the most prominent being hæmorrhage, which may be as profuse with the smaller polypi as with the larger, depending probably upon their nearness to the cervical canal; at least, we find it much more profuse when the outgrowth is enclosed in that canal than when it projects far into the vagina. As to the source of the hæmorrhage, Dr. West remarks that—

"The growths themselves are well supplied with vessels; if wounded, they bleed; if excised, the hæmorrhage which takes place from their pedicle is sometimes considerable, has even been known to prove dangerous; but yet all evidence goes to prove that it is rather from the womb itself than from the outgrowth that the principal bleeding flows, and that the hæmorrhage is proportionate, less to the size of the outgrowth than to the intimacy of the relation between it and the womb." (West, p. 258.)

The diagnosis may be difficult or impossible if we trust alone to the

finger, but even with the speculum we may not discover the polypus if it be within the cervical canal or the uterus.

"The only rule that can be given for practical guidance, however, is this: that in no case of long-continued menorrhagia should we be content with mere digital examination, but should invariably employ the speculum; and further, if no satisfactory conclusion be thereby arrived at, we should dilate the os uteri with sponge tents, in order that the cervical canal may be brought within reach both of examination with the finger and with the speculum." (West, p. 260.)

The removal of these outgrowths is the only remedy; the smaller ones may be twisted off, the larger twisted and excised; the cysts punctured or scarified, and the acid nitrate of mercury applied. Dr. West objects to the forcible avulsion of polypi, and sees no advantage in their strangulation by forceps constructed for that purpose.

At the end of this chapter there is a short but interesting account of those semi-organized clots sometimes found in or expelled from the uterus, which have been termed fibrinous polypi, and were first described by Professor Kiwisch.

"In certain conditions, independent, as he believes, of impregnation; consequent, as others think, upon previous abortion, the walls of the uterus may be so soft and yielding as to allow of the gradual accumulation of effused blood in the cavity of the organ. In the course of time the clot may not only pass through those changes by which the colouring matter is removed from its exterior, which assumes a dirty white or greyish aspect, while portions of a dark red hue are still to be found within, but may also be the seat of the same kind of imperfect organization as has been observed in the case of hæmorrhages into the arachnoid, or of blood effused in other situations. Like cardiac polypi, so these become firmly adherent to the walls of the cavity within which they form; and the late Franz Kilian, of Mayence, found one, whose constituent fibrin was in various stages of fibrillization, while its surface had received a partial investment of tesselated epithelium, which he believed to be due to the advanced organization of the outer layer of fibrin." (p. 263.)

The uterus, irritated by the presence of the clot, ultimately contracts and expels it. In a case, we believe to be of this nature, which was under our care, the increased bulk caused retroversion, which was spontaneously rectified after the expulsion of the clot.

The lecture on Fibrous Tumours of the Uterus is a very able one, bringing to bear upon the subject all the light which modern investigation has thrown upon its nature and history. We know now that the structure of these tumours is nearly identical with that of the uterus itself. However they may differ in appearance, when divided they consist of fibres of dense cellular tissue, or of tendinous substance, or of elastic tissue, intermixed with cytoblasts and granular matter, with the broad unstriped muscular fibres of the uterine tissue. Their situation varies; they may occupy the outer or inner portion of the uterine parietes, and in process of growth may project beneath the peritoneum, or into the uterine cavity, forming polypi; or they may remain in the centre of the uterine substance. The presence of these tumours gives rise to increase in the size of the womb, but greater in proportion with the smaller tumours and with those that project into the cavity, and that not merely by distension but by growth of the tissue and unfolding of its muscularity, such as takes place in pregnancy. These morbid growths vary much in number

and size, and in their course there are attempts made at cure, sometimes successful, at others unsuccessful.

"In the case of fibrous tumours, there are five different modes in which this attempt is made. Either the pedicle undergoes a process of gradual attenuation, and then gives way, the tumour thus becoming detached from the uterus; or more rarely, a portion of its investment becomes ulcerated or dies, and the growth gradually shells out from the sheath of the cellular membrane which contained it; or a change takes place in its substance, the exact nature of which is not quite understood, it becomes disintegrated, dies, and is got rid of piecemeal; or a different change occurs, similar to what we see in other morbid products,—the tumour undergoes the cretaceous transformation, and though not eliminated from the womb, it ceases to stand in any vital relation to it, and the symptoms which it once produced, diminish or altogether disappear." (West, p. 272.)

In the majority of cases the diagnosis is not very difficult.

"The sound may show the cavity of the uterus to be elongated; and I believe that an enlarged and heavy and somewhat hard uterus, coupled with the causeless occurrence and frequent return of uterine hæmorrhage, while the os and cervix uteri are healthy, are almost always pathognomonic of fibrous deposit in the uterine substance."

Still, cases occur every now and then which require the utmost care and skill to avoid mistakes, and these are principally where the question is between uterine and ovarian enlargements, sometimes between fibrous tumours and pregnancy, and sometimes of fibrous tumours complicated with pregnancy. The argument *par voie d'exclusion*, as the French term it, is of great value here; and, in addition, we may derive more or less positive evidence from the previous history of the case, from the equal or unequal density of the tumour, and from the use of the uterine sound. Dr. West's remarks upon these exceptional cases are very judicious, and the rules he lays down as precise as is possible under the circumstances. There is one sign, however, which he does not notice, and which we have found very satisfactory in many cases. If the point of the finger be placed on the cervix uteri, and slight but sudden pressure or percussion be made upon the abdominal tumour, the shock communicated to the finger is distinct and clear when the tumour is uterine, or when the communication is continuous and unbroken; but it is obscure and faint in the case of ovarian tumour.

As to the treatment, we agree with Dr. West, that if by precautionary measures we can prevent mischief, and by the use of iodine, &c. we can retard their growth, it is quite as much as we can expect. He has not succeeded in arresting or diminishing them, and he is not favourable to the surgical operations which have been attempted, unless the tumour have passed into the vagina.

The last subject treated of in the volume is Malignant or Cancerous Disease, under which title is included the varieties of ordinary cancer, epithelial cancer, corroding ulcer, &c. The author gives a very good description of the pathology of cancer, according to the most recent researches, and its effects upon the neck of the womb, its most common seat; or when it attacks the body of the organ; as also the condition and changes in the neighbouring tissues.

Among the predisposing causes of cancer, we find age very prominent, its frequency increasing with every ten years beyond twenty. The condi-

tion of the menstrual function seems to exert no influence, and, contrary to the common belief, women who have not had children are not more liable to cancer. Hereditary taint prevails to a certain extent.

The most common symptoms, as every one knows, are pain, hæmorrhage, and leucorrhœa; and Dr. West has given us the following statement as to the occurrence of the first symptoms in 116 cases. In 23 it began by pain; in 50, by hæmorrhage; in 12, by pain and leucorrhœa; and in 18, by leucorrhœa without pain. He has entered minutely into the characters, course, and variations of each of these symptoms, and has given a graphic description of the cancerous cachexia. Of the results of cancer of the neck complicating labour, we find that in 74 cases, 41 women died in or very soon after labour, and 33 recovered from the effects of labour; while of 72 children, 47 were born dead, and 25 alive. In 17 cases, Dr. West was able to ascertain the exact duration: it was under four months in 1 case; under five in 2 cases; under nine in 1 case; under twelve in 3 cases; exactly a year in 2 cases; between one and two years in 4 cases; between two and two and a half years in 2 cases; between two and a half and three years in 1 case; and exactly three and a quarter years in 1 case: giving an average duration of fifteen months; rather less than the average in Lebert's cases.

The treatment of cancer consists in maintaining, as far as possible, the general health, and in the relief of local symptoms. Dr. West does not believe in the possibility of arresting the first stage of the disease. For the purpose of arresting the hæmorrhage, all exciting causes must be removed, the bowels kept free by mild saline aperients, and a mild unstimulating diet employed. We agree with Dr. West, that local depletion is a very questionable measure at best, and decidedly bad if the blood be drawn from the uterus itself. Internally, gallic acid seems to have succeeded best as an astringent, and infusion of matico as a local application. We strongly recommend Dr. West to try the tincture of Indian hemp, from which we have derived much benefit.

In soft medullary cancer, or epithelial cancer, Dr. West recommends Kiwisch's plan of breaking down the tissue with the finger, and injecting into the midst of it the tincture of the sesquichloride of iron.

Sooner or later, anodynes become necessary, and we are wisely recommended to commence with the mildest. Some kind of astringent injection will be advisable to control the discharge, and Dr. West prefers matico, tannin, or oak bark to zinc or alum, and, we think, with good reason. He speaks highly of a very weak acid lotion, as not only diminishing the discharge, but improving the surface of the ulcer. We can corroborate Dr. West's statement, that a solution of the nitrate of silver will not only improve the ulcer and remove the fœtid odour, but frequently relieve the pain.

After detailing the treatment required by the cancerous cachexia, and the secondary affections, we come to the feasibility of any operative proceedings. The propriety of removing the entire uterus is disposed of by the fact, that of 25 cases in which it was tried, 22 died in consequence of the operation, without any adequate prolongation of life.

Excision of the cervix is less objectionable, of course, but we rarely see the disease in the most favourable stage for the operation; and we are

very much inclined to agree with Dr. West, that the operation should be almost limited to epithelial cancer of the cervix.

We have now laid before our readers a sketch of the contents of this valuable work, briefly, it is true, but sufficiently full to justify the high opinion we expressed at the commencement of this notice.

We trust to welcome contributions from the pen of Dr. West for many years to come; for when a man of such a scientific mind and careful observation and untiring diligence applies himself to any given department, the result must be a great and valuable augmentation of our information.

Review X.

On the Constitutional and Local Effects of Disease of the Supra-Renal Capsules. By Thomas Addison, M.D., Senior Physician to Guy's Hospital.—*London*, 1856. pp. 39. Plates.

Dr. Addison, the distinguished Senior Physician of Guy's Hospital, rather more than a year ago, laid before the medical profession a monograph, in which he endeavoured to prove that a peculiar bronzed condition of the skin, accompanied by a remarkable and fatal form of cachexia, is characteristic of disease of the supra-renal capsules. He states that he stumbled upon the curious facts which form the groundwork of his interesting and suggestive essay, while seeking to throw some additional light on a form of anæmia occurring without any discoverable cause whatever, in cases "in which there had been no previous loss of blood, no exhausting diarrhœa, no chlorosis, no purpura, no renal, splenic, miasmatic, glandular, strumous, or malignant disease." That he should have *stumbled* upon them is not remarkable, inasmuch as, in the present state of our knowledge, no *à priori* reasoning could have suggested any, even the remotest, connexion between disease of the supra-renal glands and disease of the tegumentary system. Yet to have recognised the importance of facts that have come, as it were, accidentally before us, and then, by a careful investigation of them, to have acquired an insight into the laws which regulate their connexion with one another, are deserving of high praise. And to such praise Dr. Addison is fairly entitled, if the observations he has published are the result of as much well-directed labour and thought as his character as an observer would warrant us in believing them to be.

Dr. Addison, after characterizing his work as "a first and feeble attempt towards an inquiry into the functions and influence of the supra-renal capsules, as suggested by pathology," expresses the hope that—

"However unimportant or unsatisfactory his facts may at first sight appear, they may, by attracting the attention and enlisting the co-operation of the profession at large, lead to the subject being properly examined and sifted, and the inquiry so extended as to suggest at least some interesting physiological speculations, if not still more important practical indications." (p. 4.)

This hope has been to some extent realized; and chiefly through the energy of Mr. Jonathan Hutchinson,* a large amount of evidence has been collected from all sources, strongly confirmatory of the views

* Medical Times and Gazette, Nos. 297 and 299, 1856.

originally promulgated by Dr. Addison. We feel—though truly the whole subject is still involved in deep obscurity—that the time has already arrived when the facts that have accumulated may be weighed, and their value approximately estimated.

We purpose in the present article first to describe the symptoms and pathology of the disease which forms the subject of Dr. Addison's book, and then to discuss the evidence by which *it is supposed* that the dependence of the general symptoms on disease of the supra-renal bodies is established. It is only fair, however, to premise, that from a comparison of almost all the cases that have been recorded subsequently to the appearance of Dr. Addison's work, and of those which are published by Dr. Addison himself, Mr. Hutchinson has so carefully described the disease, and so fairly examined the evidence in relation to it, that there is little else left for us to do, in the almost necessary absence of anything like a good practical acquaintance with the subject, than to follow in his footsteps and to make free use of his valuable papers.

Dr. Addison's description of the disease is short, and we are therefore tempted to quote it entire. He says:—

"The leading and characteristic features of the morbid state to which I would direct attention, are, anæmia, general languor and debility, remarkable feebleness of the heart's action, irritability of the stomach, and a peculiar change of colour in the skin, occurring in connexion with a diseased condition of the supra-renal capsules.

"As has been observed in other forms of anæmic disease, this singular disorder usually commences in such a manner that the individual has considerable difficulty in assigning the number of weeks or even months that have elapsed since he first experienced indications of failing health and strength; the rapidity, however, with which the morbid change takes place, varies in different instances. In some cases that rapidity is very great, a few weeks proving sufficient to break up the powers of the constitution, or even to destroy life; the result, I believe, being determined by the extent, and by the more or less speedy development, of the organic lesion. The patient, in most of the cases I have seen, has been observed gradually to fall off in general health; he becomes languid and weak, indisposed to either bodily or mental exertion; the appetite is impaired or entirely lost; the whites of the eyes become pearly; the pulse small and feeble, or perhaps somewhat large, but excessively soft and compressible; the body wastes, without, however, presenting the dry and shrivelled skin, and extreme emaciation, usually attendant on protracted malignant disease; slight pain or uneasiness is from time to time referred to the region of the stomach, and there is occasionally actual vomiting, which in one instance was both urgent and distressing; and it is by no means uncommon for the patient to manifest indications of disturbed cerebral circulation. Notwithstanding these unequivocal signs of feeble circulation, anæmia, and general prostration, neither the most diligent inquiry, nor the most careful physical examination, tends to throw the slightest gleam of light upon the precise nature of the patient's malady; nor do we succeed in fixing upon any special lesion as the cause of this gradual and extraordinary constitutional change. We may indeed suspect some malignant or strumous disease; we may be led to inquire into the condition of the so-called blood-making organs, but we discover no proof of organic change anywhere—no enlargement of the spleen, thyroid, thymus, or lymphatic glands—no evidence of renal disease, of purpura, of previous exhausting diarrhœa, or ague, or any long-continued exposure to miasmatic influences; but with a more or less manifestation of the symptoms already enumerated, we discover a most remarkable, and, so far as I know, characteristic discoloration taking place in the skin—sufficiently marked indeed as generally to have attracted the attention of the

patient himself, or of the patient's friends. This discoloration pervades the whole surface of the body, but is commonly most strongly manifested on the face, neck, superior extremities, penis and scrotum, and in the flexures of the axillæ and around the navel. It may be said to present a dingy or smoky appearance, or various tints or shades of deep amber or chesnut-brown; and in one instance the skin was so universally and so deeply darkened, that, but for the features, the patient might have been mistaken for a mulatto.

"In some cases this discoloration occurs in patches, or perhaps rather certain parts are so much darker than others, as to impart to the surface a mottled or somewhat checkered appearance; and in one instance there were, in the midst of this dark mottling, certain insular portions of the integument presenting a blanched or morbidly-white appearance, either in consequence of these portions having remained altogether unaffected by the disease, and thereby contrasting strongly with the surrounding skin, or, as I believe, from an actual defect of colouring matter in these parts. Indeed, as will appear in the subsequent cases, this irregular distribution of pigment-cells is by no means limited to the integument, but is occasionally also made manifest on some of the internal structures. We have seen it in the form of small black spots, beneath the peritoneum of the mesentery and omentum—a form which in one instance presented itself on the skin of the abdomen.

"This singular discoloration usually increases with the advance of the disease; the anæmia, languor, failure of appetite, and feebleness of the heart, become aggravated; a darkish streak usually appears upon the commissure of the lips; the body wastes, but without the extreme emaciation and dry harsh condition of the surface so commonly observed in ordinary malignant diseases; the pulse becomes smaller and weaker, and, without any special complaint of pain or uneasiness, the patient at length gradually sinks and expires. In one case, which may be said to have been acute in its development as well as rapid in its course, and in which both capsules were found universally diseased after death, the mottled or checkered discoloration was very manifest, the anæmic condition strongly marked, and the sickness and vomiting urgent; but the pulse, instead of being small and feeble as usual, was large, soft, extremely compressible, and jerking on the slightest exertion or emotion, and the patient speedily died.

"My experience, though necessarily limited, leads to a belief that the disease is by no means of very rare occurrence, and that were we better acquainted with its symptoms and progress, we should probably succeed in detecting many cases, which, in the present state of our knowledge, may be entirely overlooked or misunderstood; and, I think, I may with some confidence affirm, that although partial disease of the capsules may give rise to symptoms, and to a condition of the general system, extremely equivocal and inconclusive, yet that a more extensive lesion will be found to produce a state, which may not only create a suspicion, but be pronounced with some confidence to arise from the lesion in question. When the lesion is acute and rapid, I believe the anæmia, prostration, and peculiar condition of the skin will present a corresponding character, and that whether acute or chronic, provided the lesion involve the entire structure of both organs, death will inevitably be the consequence." (pp. 4—7.)

The description, derived from an analysis of about twenty-seven cases which Mr. Hutchinson gives of the disease, is strongly confirmatory of the account which we have just quoted; and in the commentary we are about to subjoin, we shall avail ourselves largely of his labours.

The change of colour of the skin would appear to be the most marked and constant symptom. If the accounts that are published are trustworthy, it would seem that this change is one of the earliest symptoms of the disease, that it frequently precedes all others, and that it becomes more and more intense up to the final issue. The tint assumed evidently

varies in different cases, for sometimes the skin is described as having a light yellowish-brown hue, while at other times it is stated to resemble that of a mulatto. In all cases, however, it would seem that the term "bronzing" conveys a good idea of the character acquired by the skin. "It strongly resembles," says Mr. Hutchinson, "the colour of a bronzed statue from which the gloss has been rubbed off." Pressure has no effect in causing its diminution. It seems, as a rule, to commence in patches with ill-defined borders on those parts exposed to the air and to friction, and on those parts where pigment naturally abounds, and to spread thence over the general surface of the body. Those parts, however, which originally present little or no pigment, as the palms of the hands, soles of the feet, ungual matrices, &c., appear to remain unaffected to the last. The discoloration is said occasionally to invade the lips, and occasionally to extend even to other parts of the mucous membrane of the mouth. But it has not been satisfactorily observed in any other part of the body. For although Dr. Addison states that in one case there was black pigmentary deposit in the peritoneum, it must be borne in mind that there was tubercular peritonitis as well, and in such cases the appearance of black spots and patches in that situation is exceedingly common. Hence it would appear that the discoloration is, so far as is at present known, strictly limited to the skin and those portions of the mucous membrane which adjoin integument. And it is important to bear in mind that the conjunctivæ are stated in almost all cases to have remained clear and pearly. We may add that, in three instances, a peculiarly disagreeable sickening odour was exhaled from the patient's body, a circumstance which does not appear to have attracted Dr. Addison's attention, and which possibly may not have existed in any of his cases. Mr. Hutchinson observes that:

"Next to the bronzing of the integument, the extreme and peculiar feebleness manifested appears to be the most striking of the symptoms. Without any evidence of thoracic disease the patient becomes liable to faintings, loses energy, is unable to exert either body or mind, and, in short, appears to be on the point of death from sheer weakness.

"That there has generally been observed a want of correspondence between the extreme debility and the degree of emaciation coincident with it, seems evident. Several of the patients are described as having remained muscular and fat up to the very last. In almost all, however, there had been some loss of flesh, and in many it had even been considerable. Dr. Addison's observation, that flabbiness of the solids rather than actual wasting is characteristic of the condition, seems true of the majority of cases.

"In almost all cases there would seem to have been present great depravation of the coloured constituents of the blood, as manifested by the pallor of those parts not involved in the bronzing, the general flabbiness of the muscles, the pearly state of the conjunctiva, &c. In two only was the blood examined with the microscope, and in both those it was found to be loaded with white corpuscles.

"In almost all cases prior to death, and in many for protracted periods, great irritability of the stomach was present. In most there was loss of appetite, more or less persistent nausea, and occasional vomiting, with pain and sense of sinking at the epigastrium. In the majority it would seem that the bowels have been costive rather than otherwise, while in a few, attacks of diarrhœa had occurred." (Med. Times and Gaz.)

Symptoms referrible to disorder of the cerebro-spinal system occurred

in several of the cases. In a few instances death was preceded by a low form of muttering delirium. In one case failure of memory was noted; in another numbness of the fingers, legs, and tip of the tongue. In two or three cases neuralgia was present. Two patients had epileptic attacks, but in one of the two this complication was clearly due to disease of the medulla oblongata.

In the generality of cases the pulse was peculiar only in its extreme softness and compressibility.

Pain in the loins was frequently complained of, but is probably to be looked upon as only a part of that general debility from which the patients were suffering.

Neither the tongue nor the urine appears to have exhibited any important deviation from the healthy condition.

Judging from the few cases in which the mode of death has been described, Mr. Hutchinson remarks, "the phenomena attending death are those of utter prostration of the vital powers, not unfrequently complicated by disturbance of the nervous functions."

From all that is above stated, we think it may be assumed that the distinctive features of the disease under consideration are the peculiar discoloration of the skin, and the general anæmic condition; for neither the dyspeptic nor the nervous symptoms are sufficiently constant or uniform in character to render it probable that they are anything more than the natural sequelæ of the progressive and extreme debility. Now, the anæmic condition does not appear to us to differ, except in the fatality that attends it, from that which accompanies many other forms of disease; and hence it is clear that it is upon the peculiar changes taking place in the skin that we must mainly rely in forming our diagnosis. It is therefore highly important that we should be able to distinguish the bronzed condition of the integument, supposed to be indicative of renal-capsular disease, from other affections attended by discoloration, to which the skin is liable. Mr. Hutchinson has, we believe, correctly pointed out the distinctive marks by which a differential diagnosis between true bronzing of the skin and other cutaneous affections may be established. *Jaundice* may be discriminated, not only by the general symptoms which accompany it, but by its peculiar tint, by its uniform diffusion, and by its presence in the matrices of the nails and in the conjunctivæ. *Browning from exposure to the sun* may be recognised by its occurrence in those situations only which are habitually exposed.

"*Patches of Pityriasis versicolor* sometimes remarkably resemble those of bronzed skin. Their limitation to the abdomen and chest, their defined outline, their furfuraceous surface, the slight itching which attends them, their contagious character, and, above all, the microscopic examination of the cuticle, furnish, however, abundant means by which to distinguish between the two." (Med. Times and Gaz.)

Mr. Hutchinson remarks, lastly, that it is important not to confound the diffused brown muddiness of some other cachexiæ with the bronzing of supra-renal disease. With regard to the means of distinguishing by means of the microscope between pityriasis versicolor and true bronzed skin, we may remark, that although we believe Mr. Hutchinson's opinion will prove correct, we suspect that he has asserted more than our present knowledge justifies him in asserting. It is somewhat strange, yet we

believe it to be a fact, that up to the present time it is a mere assumption that the bronzed condition of the skin depends on pigmentary deposit—at least, so far as we know, no account of its microscopical examination has been published.

The morbid anatomy of the supra-renal capsules need not detain us long. The diseases which have been found in them, in connexion with bronzed skin, are various:—1. Acute and recent inflammation, ending in abscess. 2. Atrophy, with fibro-calcareous concretions. 3. The conversion of the viscus into a sort of fibroid structure, with great enlargement and induration. 4. The deposit of tubercle, or of a fibroid material resembling tubercle. 5. The growth of cancer. Occasionally the affection of the glands, especially when of a cancerous nature, appears to be secondary to disease in other parts; but it is a very interesting fact, that in many cases these bodies were the only organs in which disease was detected. It is scarcely necessary to say that the supra-renal glands are sometimes partially diseased, and that sometimes one or both are wholly destroyed; but it is very important to bear in mind, that, to judge from the cases that have been published, the degree of bronzing, and the severity of the general symptoms, appear to have been proportionate to the amount of disease in these bodies, and to have had no relation whatever to the nature of that disease.

It will, we conceive, be readily conceded, that the facts above given are very remarkable, and if the suggested connexion between them turn out to be real, exceedingly valuable and important. We will proceed, therefore, now to examine the evidence by which the dependence of the fatal cachexia, and of the concurrent change in the colour of the skin, upon disease of the supra-renal capsule, is thought to be proved. Before we enter on this subject, however, it is very essential that it should be clearly understood, that the proof of the coincidence of these phenomena by no means establishes that the one is the cause of the other; indeed, such a proof would still leave it an open question,—whether the disease in one of the organs is the cause of the morbid changes in the other, and of the general symptoms—or, whether the supra-renal disease, and the affection of the skin, like the intestinal ulceration and cutaneous rash of typhoid fever, are concurrently the efflorescence, if we may so express it, of some more deeply-seated systemic mischief.

Up to the present time, about 33 cases of bronzed skin, including the 12 originally furnished by Dr. Addison, have been published. Of this number all but one died. In 6 cases no autopsy was made, and in 2 the supra-renal glands were overlooked at the time of the post-mortem examination. But in every other case—that is, in every one of the remaining 23—these bodies were found in a more or less diseased condition. And hence it follows, that notwithstanding the close attention that has for several years past been paid to the subject in Guy's Hospital, and the general interest that has been manifested in it throughout the profession since the publication of Dr. Addison's work, upwards of a year ago, not a single case has been published, in which a bronzed condition of the skin has been proved to have existed without manifest disease of the supra-renal capsules having been present at the same time. Now we do not mean to affirm that all the 23 cases, in which the association of these

phenomena was proved by post-mortem examination, are altogether trustworthy; the details of several are very meagre and imperfect; and with regard to one or two, perhaps, a suspicion might arise that the authors had unconsciously modified or moulded the facts, to adapt them to Dr. Addison's views. Still, allowing for all these possible sources of error, we feel convinced that a critical examination of the above cases, so far from weakening, will tend materially to strengthen the evidence in favour of the close connexion between the two pathological phenomena of which we are speaking. In 7 of the cases, either one organ only, or both partially, were diseased. In 16, the healthy structure of both organs was wholly destroyed; and in 9 or 10 of these, the supra-renal bodies were the only organs in which any trace of disease was recognised. In nearly every one of the 16 cases in which both organs were found affected, the change in the colour of the skin was so marked, as to have attracted the attention of the patient and his friends; and in several of the cases that are related by Dr. Addison, and in several of those that have been subsequently described, disease of the supra-renal glands was diagnosed during life. One of the latter cases is so remarkable and conclusive, that we are tempted to give a short abstract of it. It was under the care of Drs. Ranking and Vincent, and a complete account of it was published in the 'Medical Times and Gazette' for May 24th of the current year. The patient was a lady, fifty-nine years of age. In May, 1855, she first observed that the skin of her face and hands was discoloured, and she was often annoyed when making calls, by friends offering her water to wash her hands. Her appetite failed, the stomach rejected almost everything, and emaciation became very evident. The symptoms gradually increased, and in August, and again in October, she consulted Dr. Ranking, who states, that on these occasions she complained mainly of great and increasing loss of strength, with sinking at the pit of the stomach, nausea, and complete loss of appetite. The face was dark brown, as dark, in fact, as that of a Japanese. The hands also were discoloured, especially at the knuckles. Her heart's action was feeble. The secretions of the liver, intestines, and kidneys were healthy. The case continued a complete mystery to all who were concerned in it up to December, when Dr. Vincent, happening to read a review of Dr. Addison's work, was struck by the remarkably close analogy between the case that so sorely puzzled him and those which are described by Dr. Addison. He mentioned the suspicions that naturally arose in his mind to Dr. Ranking, who, when put in possession of the circumstances on which they were founded, fully acknowledged their justice. The consequence was, that the case was published in the 'Medical Times and Gazette' for December 22nd, 1855, as one in which supra-renal disease probably existed. The symptoms continued with but little alteration up to the 25th of April, 1856, on which day the patient died, extremely emaciated, after several hours' muttering delirium. A tolerably careful post-mortem examination was made. All the abdominal and thoracic viscera were found healthy, with the single exception of the supra-renal glands. These bodies were enlarged, they were infiltrated with a putty-like deposit, and their normal structure was wholly destroyed. That they were completely disorganized is confirmed by the testimony of Drs. Addison and Wilks, to whom they were referred for examination.

There is one branch of the evidence which seems strangely to have been overlooked by Dr. Addison: it is that which is furnished by an examination of the supra-renal capsules in those cases in which no bronzing of the skin has existed. This deficiency has been supplied by Dr. Wilks, who states (Dec. 29, 1855) that, in 500 post-mortem examinations conducted in Guy's Hospital during the previous two years, in one instance only was disease in the capsules found unassociated with discoloration of the skin, and in that case only a few malignant tubercles grew from the surface of one of the organs. It is quite certain, however, that, during the last year, several examples (to say the least) have been met with, in which one or both glands have been partially diseased, and in which no discoloration of the skin has occurred. We have ourselves, within the last four months, examined four cases in which these bodies were partially diseased—three times with cancer and once with fibro-calcareous deposit—and in which we do not feel justified in admitting that there was any unusual discoloration whatever of the skin. Nevertheless, no case has yet been published in which, when both glands were wholly diseased, bronzing of the skin did not co-exist. We feel justified, therefore, in saying that the following facts are demonstrated by the evidence adduced:

Sixteen cases have been recorded in which a bronzed condition of the skin was associated with total destruction of the supra-renal capsules;

No case of bronzing of the skin has been published in which the capsules were found healthy;

In those cases in which partial disease of the capsules was detected, bronzing of the skin has been sometimes present, sometimes absent;

But, not a single case is on record in which total destruction of the capsules has existed, without manifest discoloration of the skin having existed also.

We think, with these facts before us—facts the truth of which we have no reason whatever to question—that we cannot do otherwise than admit that there is really some very close connexion between bronzing of the skin and disease of the supra-renal capsules: nay, further, that there is very strong reason for believing that bronzing of the skin may be looked upon as diagnostic of disease of the supra-renal capsules.

Assuming, then, the intimate connexion between these two pathological phenomena to be established, it remains for us to inquire what the nature of that connexion is. Is the capsular disease dependent on the skin affection?—are these two morbid conditions the coincident effects of some other cause?—or is the affection of the skin produced by disease of the supra-renal capsules?

Now, by reference to the statements which were made in the last paragraph, it will be seen that, though a bronzed condition of the skin seems always to have been attended by disease of the capsules, disease of the capsules has not always been accompanied by bronzing of the skin; and hence it is clear that the cutaneous discoloration may be dependent on the capsular affection, but that the converse of that proposition cannot be for a moment maintained. That the two morbid conditions are the coincident effects of some other cause, is a view the probability of which has most likely suggested itself, at one time or other, to the minds of all who have bestowed any thought on the subject; but we believe a little con-

sideration will prove it to be altogether untenable: for had the morbid condition of the supra-renal glands been produced by some agency which was at the same time working its ill effects on the integument, we should have expected to find the same unity of type in the disease of the glands as appears to have been found in that of the skin. The diseases in the glands, however, which have been found associated with bronzed skin, present the most varied characters; and indeed, all the evidence goes strongly to show that bronzing of the skin, and the cachectic symptoms which accompany it, are found to be associated with every form of disease that has yet been recognised in these bodies, provided that disease be sufficiently extensive to have effected their entire destruction. The third alternative is thus irresistibly forced upon our attention; and that it furnishes a correct explanation, so far as it goes, of the disease in question, is rendered nearly certain by the fact, that those considerations which militate so powerfully against the first two alternatives, are strong positive arguments in favour of this. We believe, therefore, that the evidence before the profession with regard to supra-renal capsular disease, proves not only that such a condition of the skin as has been described at a previous page is diagnostic of disease of the supra-renal capsules, but that disease of the supra-renal capsules is the cause of that discoloration of the skin, and we may add, of the symptoms that co-exist therewith.

There are yet two or three points which deserve to be alluded to before we bring the present article to a conclusion:—1. Dr. Addison speaks in very gloomy terms of the prognosis of the disease. It is possible that his fears may be well founded. Indeed, it is certain that the published cases confirm them. We must recollect, however, that most of these cases, and certainly the more conclusive ones, were cases in which the glands were structurally and irremediably disorganized; and since we have no reason to suppose that the supra-renal bodies do not resemble all other organs in being subject to transient and remediable forms of disease as well as to progressive and incurable ones, we cannot help suspecting that, as our knowledge of the disease in question becomes more extensive, we shall find that bronzing of the skin, with the attendant symptoms, is not so invariably fatal as it is at present believed to be. 2. With regard to treatment, little can be said. The symptoms usually manifested appear to indicate the desirability of the exhibition of tonics: that is the treatment that seems usually to have been resorted to, and probably with advantage; but with what ultimate benefit, may be in some measure estimated by the invariably fatal result which has attended the cases. 3. Dr. Addison has—wisely, as we think—refrained from speculating upon the functions which the renal-capsules subserve, although he has certainly shown that their importance is much greater than has generally been suspected. We are not more disposed to speculate on the subject than Dr. Addison, and shall therefore refrain from discussing the possibility of their function being a nervous one, which is a view that Mr. Hutchinson, partly on anatomical grounds, seems inclined to adopt.

Finally, we beg to reiterate our belief, that the connexion between disease of the supra-renal capsules and a bronzed condition of the skin, which Dr. Addison sought to establish, has been proved to exist; and we have to thank him, therefore, for a most valuable and interesting contri-

bution to pathology—for a work which, we believe, contains important truths, and the germs of truths probably still more important. It would be ungracious if we refused to acknowledge, also, the services which in this inquiry have been rendered by Mr. Hutchinson, and those other gentlemen who have made Mr. Hutchinson the medium by which valuable cases have been laid before the profession. We venture to hope that their good example will be followed by numerous pathologists, and that ere long the supra-renal capsules may be entitled to hold as definite position on the map of pathology as is at present occupied by other organs which have been successfully investigated by the light of modern science and by the industry of modern observers.

REVIEW XI.

1. *Ueber das Absorptionsvermögen des Bluts für Sauerstoff.* Von G. MAGNUS. ('Annalen der Physik und Chemie,' Band lxvi. 1846.)

On the Capacity of the Blood for the Absorption of Oxygen. By G. MAGNUS.

2. *The Effects of Respiration on the Inspired Air: Gases Absorbed and Given Out by the Blood.* (Chap. xxv. in 'Letters on Chemistry in its Relation to Physiology, Dietetics,' &c. By JUSTUS VON LIEBIG. 1851.)

3. *Respiration.* ('Lehrbuch der Physiologischen Chemie.' Von Prof. Dr. C. G. LEHMANN. Band iii. p. 284. Zweite Auflage.—*Leipzig*, 1853.)

On Respiration. ('Handbook of Physiological Chemistry.' By Professor LEHMANN. Second Edition.)

PHYSIOLOGY may now be said to have reached that point where an accurate knowledge of the changes produced by the respired air upon the animal economy becomes indispensably necessary not only to the just appreciation of the normal functions, but also to the comprehension of the assimilation of food and the action of medicines upon the body, not a single function of which is independent of respiration. Nervous action, muscular contraction, secretion and excretion, are alike under its sway. No change can take place in either the living or dead animal organism without an interchange of gases. Shut out the atmospheric supply, and development ceases; prevent the action of air, and decay is instantly arrested. No new cell can be formed, no old one destroyed, without the influence of this all-important agent. From the moment when the animal or vegetable germ springs into existence, throughout its development into tissues, during its whole life as an organized being, to the time of its death, and even throughout its decay, until the last cell has been resolved into its primary elements, oxygen has been uninterruptedly employed; and according to the supply of this indispensable agent have these changes been accelerated or retarded. Is it, then, surprising that a complete knowledge of the chemistry of respiration should be considered one of the principal indicators towards the understanding and treatment of disease, and that it should rank as a most important pillar in the structure of rational medicine?

The knowledge of the changes produced by the action of atmospheric air attracts us, therefore, alike by the interest and the importance connected with its acquirement.

The function of respiration, as we have said, knows no intermission so long as animal life continues; by day and by night, sleeping and waking, the lungs are ever performing their allotted labour, inhaling the fresh, and expelling the effete, air. In a single hour, taking the average number of respirations at sixteen in a minute, the gases essential to the continuance of organic life have been renewed 960 times; in the course of every twenty-four hours, no fewer than 23,040 times; and before we had passed a single short year of independent existence, our lungs had been inflated and exhausted, inhaling and exhaling oxygen and carbonic acid with each effort, until the respirations had reached the enormous number of 8,409,600. These figures, taken alone, are sufficient to point out the indissoluble bond existing between the respiratory functions and the continuance of "vital action" in the animal economy; and render us anxious to discover not only the various causes inducing the absorption of oxygen, but likewise the intricate transformations produced by its presence in the blood.

Many points connected with the changes brought about in the animal economy through the agency of the respired gases, are still involved in obscurity. We know that gases enter the blood; we know that gases of a different character, possessing other properties, emerge thence; but the form in which they exist in the liquid, and the changes they induce in its constituents, remain, in spite of all that has already been achieved, subjects to be elucidated by future investigation. If we were content to form our opinions from the beautiful experiments of Magnus, some of which we are now about to recapitulate, we might suppose that the gases interchanged into the lungs, enter into *no* chemical combination whatever with the constituents of the blood, either in their course to or from the tissues and organs, but form merely a physical mixture with the circulating liquid; a view which our philosophical author has tried hard to promulgate. To this opinion, however, we are by no means inclined to bow, inasmuch as numerous experiments, instituted by ourselves with a view of ascertaining this point, have forced upon us conclusions of a diametrically opposite character. Instead of finding, as we had been led by the experiments of Magnus to anticipate, that the gases remain in the blood unchanged, retained there merely by the laws of mechanical absorption, our experiments demonstrated to us that the gases *cannot* come into contact with blood, and remain in a free state, but must of necessity undergo certain changes, in consequence of their entering into chemical combination with one or more of the constituents of that liquid. Although recent writers have generally adopted this view, we were, we believe, the first to prove its correctness by direct experiment.

Before relating these experiments, we shall pass in review some of those made by Magnus, and quote the conclusions at which he arrived. In so doing we shall have occasion to notice several errors which he was enabled to correct in the doctrines which had, before his time, been accepted without contradiction.

Magnus observed that a certain quantity of arterial blood, shaken

together with carbonic acid gas during several minutes, absorbed a considerable quantity of this gas, while, at the same time it gave off all the oxygen it had previously contained. This circumstance led him to conclude that the oxygen could not have been chemically combined with the blood, but had merely been present in the liquid, in a state of mechanical absorption. He rested this view on the two following grounds: Firstly, the ready displacement of the oxygen by another gas; secondly, the absence of deoxidizing power in carbonic acid gas, the replacing agent. Continuing the investigation, he found that the same portion of blood, re-saturated with oxygen, again yielded up this gas on being shaken together with a fresh portion of carbonic acid, incontestably proving, as he imagined, that these two gases replace each other thus easily in consequence of neither having any affinity for the liquid with which it was mixed beyond that necessarily dependent on the principle of absorption.

Although the fact that oxygen and carbonic acid gases possess the property of replacing each other is undeniable, we cannot help thinking that the conclusions deduced from it by Magnus are of much too general a character; and we are of opinion that a further consideration might probably lead to a considerable modification of these views. The mere fact of a gas being very easily separable from a liquid, does not of itself furnish sufficient evidence that it did not exist in the liquid in a state of chemical combination; nor is the circumstance of the replacement of one gas by another, and *vice versâ*, of any value in proving that such replacement has occurred from the absence of any greater affinity than that of mere mechanical absorption.

As we shall hereafter have occasion to prove the correctness of this statement, we may, to avoid repetition, before entering more fully into the *minutiæ* of the question, at once proceed to mention another of the series of experiments instituted by Magnus, which has a direct bearing upon the preceding one. He found by experiment, that animals, placed under circumstances which prevented their respiring oxygen, and compelled them to breathe nitrogen instead, exhaled from their lungs carbonic acid gas, just as if they had been breathing an atmosphere of common air. (This experiment had frequently before been performed by other inquirers with an exactly similar result.) From this he concluded that the exhalation of carbonic acid gas from the lungs is not necessarily dependent upon the absorption of oxygen; he asserts, moreover, from the same premises, that the carbonic acid exhaled by the lungs must have originated in the tissues, entered the blood traversing the capillaries, and been carried to the pulmonary organs, without entering, during its transit, into any chemical combination with the circulating liquid.

This is one of the facts that have worked together for the total abolition of the theory of respiration as first promulgated by the great French chemist, Lavoisier, who supposed that the respired oxygen entered into immediate combination with the free carbon imagined to exist in the lungs, for the formation of the carbonic acid gas, to be immediately expelled by the succeeding expiration. Had this mode of reasoning been correct, the temperature of the lungs must necessarily have been found higher than that of any other part of the body; for the combination of oxygen with carbon, which forms carbonic acid gas, is the chief source of

animal heat.* The lungs are, on the contrary, found almost the least warm of any of the organs of the body; and this, together with other important facts, has brought Lavoisier's theory into entire disrepute.

Before it was known that gases could be extracted from the blood, oxygen was naturally supposed to have entered into chemical combination with one or other of the constituents of that liquid; since the discovery made by Magnus, that gases not only exist in the blood, but can partly be extracted from it without much difficulty, physiologists, rushing at once to the opposite extreme, asserted, with Magnus, that oxygen enters into no chemical combination whatever, so long as it remains in the circulating fluid, and that such a combination can occur only in the tissues and organs of the body.

Magnus has not only discovered that oxygen exists in venous as well as in arterial blood, but also that carbonic acid can be extracted from arterial as well as from venous blood. The relative proportion of these gases in the two kinds of blood is, however, different—the arterial blood contains more oxygen gas than the venous; the venous, on the other hand, more carbonic acid gas than the arterial. We shall give the author's statement of the fact in his own words:

> "By means of the air-pump, a certain quantity of air was extracted from the arterial as well as the venous blood of various animals, and was subjected to analysis; and numerous experiments proved that the quantity of oxygen contained in the gas obtained from venous blood amounted at most to one-fourth, and frequently did not exceed one-fifth of the carbonic acid therein contained. In arterial blood, on the other hand, the oxygen amounted to at least one-third, and nearly to one-half of the carbonic acid; therefore, although the entire quantity of these gases in the blood cannot be ascertained, I consider absorption to be so essential an element in the function of respiration, that the latter may be considered to depend, if not entirely, at least partly, upon it." (p. 186.)

The fact that a smaller quantity of carbonic acid is found in arterial than is present in venous blood, proves that carbonic acid is either derived from the organs and tissues, and absorbed by the blood in the capillaries, or generated in the blood itself. The former view is adopted by Magnus, to the entire exclusion of the other; and the consequence has been, that although he has many followers, there exists a small class not entirely prepared unconditionally to adopt his views; and among this minority we fear we must be ranked, for we cannot divest ourselves of the belief that *both* causes must be at work to call forth the results attributed by Magnus to one of them alone.

In the preceding quotation from Magnus, it is observed that not only does carbonic acid exist in arterial as well as in venous blood, but oxygen has been discovered in the one as well as in the other. To this discovery he attaches immense importance, looking upon it as the most conclusive of all proofs that the oxygen imbibed during respiration, is not combined with, but only absorbed by, the blood. It may be, perhaps, that we are unable justly to appreciate the value of this statement, or rather of the fact, but it certainly appears to our mind to prove nothing beyond the mere circumstance that the *whole* amount of oxygen respired has not been chemically combined with the constituents either of the blood or of the

* Liebig's Letters on Chemistry, p. 317.

tissues and organs. Moreover, it is possible that the oxygen found in the venous blood forms no portion of that which had immediately before entered the lungs, but it may consist of a part of the gases set free in the retrograde transformation of some of the organic compounds in the tissues or the blood itself. If those who differ from us on this point were even to grant that oxygen enters into chemical combination with the blood, it does not necessarily follow that this liquid is capable of combining with oxygen in an indefinite amount, or that this combination must be instantaneous. We believe, on the contrary, that the constituents of the blood are capable of combining only with a limited quantity of oxygen, in order to form new organic compounds better adapted for transformation into tissues and organs, in the act of assimilation; and that as soon as these compounds are removed from the blood, a constant series of others is ready to replace them, by undergoing the same changes to which their predecessors have been subjected; and this transformation and replacement continue so long as the animal body exists in a state of healthy activity of function. The process of oxidation does not appear to be instantaneous, but, on the contrary, seems to be a slow one, dependent on circumstances to which we shall hereafter have occasion to revert.

The view taken by Magnus appears at first sight to receive additional support from an experiment he made. He took some calves'-blood, well mixed with air, placed it in a vessel with carbonic acid, shook them together during a considerable time, and on analysing the gas, found that the blood had yielded up by this process 11·6 per cent. of oxygen, and absorbed no less than 154·0 per cent. of carbonic acid gas. The same portion of blood, which had become very dark in colour, was again agitated with atmospheric air, by which process it absorbed 15·8 per cent. of oxygen, giving off only 138·4 per cent. of carbonic acid, a volume 15·6 per cent. less than it had taken up, and exactly equal to that of the oxygen which had been absorbed. The same blood was again agitated with carbonic acid gas, and this time it yielded only 9·9 per cent. of oxygen, while it absorbed 92·1 per cent. of carbonic acid. Magnus concluded from these results, that,

"The fact, that almost the whole quantity of oxygen taken up by the blood can be extracted from it again, is a striking proof that oxygen is not chemically combined with, but only mechanically absorbed by, the blood."

To the manipulation of the above experiments we have nothing to object, but our deductions from them are very different from the conclusions drawn by Magnus. According to the figures given above, it appears that blood absorbed 15·8 per cent. of oxygen, and when treated with carbonic acid, yielded up only 9·9 per cent., in other words, 62 per cent. of the whole amount of oxygen absorbed. We are somewhat at a loss to imagine how our author can call this "nearly the whole;" to us it appears to be little more than the half; and we should be inclined to opine that the remaining 37·4 per cent. of oxygen which could not again be extracted from the blood, had most probably entered in part into chemical combination with one or more of the organic substances therein contained. Our only surprise is, that so much oxygen was retained by the blood; and we can only attribute this fact to the supposition that the oxygen and blood were placed under very favourable

circumstances for the production of chemical combination; these circumstances being, agitation, length of time, a certain amount of heat, &c.

The absorption by the blood, at each renewed treatment with air, of a certain quantity of oxygen which could not be extracted from the liquid by means of replacement with carbonic acid gas, forces us to believe that some of it at least had been chemically combined with the blood; for if the oxidation and deoxidation were several times repeated, and a certain quantity of oxygen retained in the blood after each experiment, a point would at length be arrived at where the quantity of oxygen in that liquid must of necessity be far greater than we can suppose it possible for blood to contain by the laws of mere mechanical absorption. Although the blood possesses a greater absorptive power than water for oxygen, this power amounts, after all, to but one-tenth of its volume, and this, according to the ratio of Magnus indicated above, is a much smaller quantity than would be retained in the blood after repeated shakings. The fact that a greater quantity of carbonic acid is necessary in order to displace oxygen, than we need have of oxygen to displace carbonic acid, Magnus attributes to two causes—firstly, that artificially-made venous blood contains a greater amount of carbonic acid than is contained in normal venous blood; and, secondly, to the absence of any membrane having the power of absorption, as found in the lungs. These explanations do not appear to us altogether satisfactory; for we should think that the absorption of oxygen by artificial venous blood would be regulated by the same law which governs its absorption in real venous blood. We are not aware of any chemical difference in these two bloods, beyond the circumstance that the amount of carbonic acid existing in the one, may in some degree exceed that present in the other. And even this difference can only exist under peculiar circumstances; for if the two bloods be left to themselves, exposed to an atmosphere of common air, they would speedily become identical. If we were to hazard an opinion on the subject, we should rest our attempted explanation on very different grounds.

The law of absorption being the same for all gaseous bodies, the amount of a given gas absorbed always stands in direct proportion to the attraction possessed by the liquid for the individual gas at the particular temperature. When blood thoroughly saturated with oxygen is introduced into a tightly-closed bottle, containing a certain amount of carbonic acid, and well agitated, the oxygen gas will escape from the blood, and diffuse itself among the carbonic acid gas; and, on the other hand, the carbonic acid will be absorbed by the blood, until an equilibrium has been established between the portions of the gases contained in the blood itself, and in the free space above it. The interchange of the gases will cease as soon as the proportion of each one in the blood is exactly similar to the amount which the same liquid has the power of absorbing under a pressure equal to the one existing in the closed vessel. As the absorptive power of the blood with regard to oxygen gas is very small when compared with that of the same liquid for carbonic acid gas, the proportion of oxygen escaping from the blood, and diffusing itself throughout the space occupied by carbonic acid, will be very much smaller than the quantity of carbonic acid which the blood will absorb before the equilibrium is established.

It has just been remarked, that the absorptive power of blood for oxygen, though absolutely considerable, is relatively small when compared to the affinity of the same liquid for carbonic acid. Magnus has clearly demonstrated this by an interesting experiment, the result of which was, that one volume of blood can absorb 1½ time its volume of carbonic acid (Davy and others have obtained nearly the same proportions), and only about one-tenth of its volume of oxygen gas. Thus we see that blood has the power of absorbing, on an average, nearly thirteen times as much oxygen as water does; a fact almost sufficient in itself to prove the fallacy of the doctrine, that oxygen does not enter into chemical combination with the constituents of the blood, and one beautifully turned to account by Liebig in his attempted disproof of Magnus's doctrine. Liebig, reasoning from analogy, has shown that the oxygen *must* exist in the blood in some other form than that of mere mechanical absorption; for while, as he says, 1000 volumes of water, when agitated with air until thoroughly saturated, absorb only 9¼ volumes of oxygen (Guy Lussac), 1000 volumes of blood, treated in precisely the same manner (Magnus), absorb no less than 100 to 130 volumes of oxygen gas. Now, since the liquid part of the blood is nothing more or less than water, and as blood absorbs from eleven to fourteen times more oxygen than the same quantity of pure water would do under similar circumstances, it is obvious that the excess of oxygen taken up by the blood cannot depend upon the absorptive power of its liquid (which is pure water), but upon the presence of certain constituents having a much more powerful attraction for oxygen than water possesses. Although the degree of attraction by which the oxygen is retained in the blood is comparatively slight, this is by no means a proof that the gas is not in a state of chemical combination; it being well known that very numerous chemical combinations are as readily, or even much more easily, destroyed than that of the oxygen in the blood; and nevertheless they are true chemical compounds, in every sense of the word.

The absorptive power of water for particular gases can be very much augmented by the addition of certain substances possessing a chemical attraction for the gas. Liebig has shown that if one per cent. of phosphate of soda be added to water, the absorptive power of that liquid for carbonic acid gas is immediately doubled; notwithstanding this, the gas can again be separated from the solution by simple agitation with air, just as is the case with venous blood. Still, no one would think of regarding this as an instance of mechanical absorption; for in every case in which any particular gas is retained in a liquid by mere mechanical absorption, the quantity of gas so detained depends entirely upon the tension of the particular gas at the surface of the liquid, and increases or diminishes in the ratio of the tension; whereas, when a gas is chemically combined in a liquid, the absorptive power of the solution does not increase in proportion to the pressure or tension, but stands in direct relation to the amount of the dissolved substance, whose particles have a chemical attraction for the gas. This, as Liebig has remarked, is beautifully exemplified in the case in point. No sooner has the solution of phosphate of soda become saturated with carbonic acid (having taken up twice as much of the gas as water alone would have done under the same pressure), than the absorptive power of the solution ceases to increase in the same ratio when

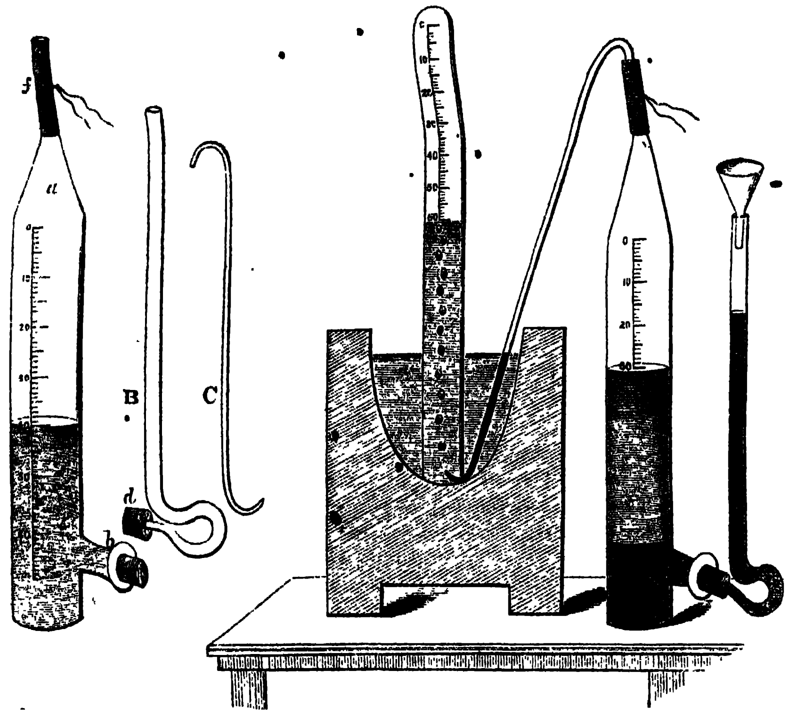
the pressure is doubled, but augments in a much smaller one. This is in consequence of the cessation, upon the combination being completed, of the chemical attraction which at first increased its absorptive power.

So far as is yet known, the blood behaves towards gases in exactly the same way as a solution of phosphate of soda towards carbonic acid. The attraction possessed by blood for oxygen gas does not follow the law of absorption laid down by Henry and Dalton, and so beautifully explained by Bunsen, but appears to resemble much more closely effects looked upon as those of chemical affinity. The remarkable fact observed by Reisit and Regnault, that animals breathing in an atmosphere containing two or three times more oxygen than goes to the formation of ordinary air, exhibited no visible symptoms of uneasiness, and that the product of their respiration did not differ either in quantity or relative proportion from the result of their breathing in common air, goes far to establish the theory that oxygen is not mechanically absorbed, as Magnus believes, but enters into chemical combination with one or more of the constituents of the blood. The last-mentioned fact, taken *per se*, we believe indeed to have had the opportunity of proving beyond a doubt, by numerous experiments instituted on this subject in Professor Bunsen's laboratory at Heidelberg. The method we employed in analysing the gases obtained by treating the blood in various ways, was the one described by Professor Bunsen, which has become so justly celebrated on account of its great exactitude. Our experiments were made principally with the view of ascertaining—firstly, whether blood has the property of chemically combining with oxygen; secondly, which of its constituents enter into combination with oxygen; thirdly, whether these constituents, by combining with oxygen, simply become oxidised, or whether they at the same time give off carbonic acid gas; lastly, what are the agents which control these changes?

In order to ascertain these points, a certain quantity of blood was agitated with renewed portions of air, until it became thoroughly saturated with oxygen, and had yielded up all its carbonic acid, or at least as much as it could possibly give off. The blood so treated was then introduced into a graduated glass retort, of the shape represented in the accompanying figure (Fig. A). The neck (*a*) was drawn out to a fine capillary tube, upon the end of which was placed a piece of caoutchouc tube. After a certain quantity of blood (*c*) had been introduced at the mouth (*b*), the latter was firmly closed with a tightly-fitting cork, and the remaining opening at (*f*) secured by a ligature drawn tightly on the caoutchouc tube, so that all communication between the external atmosphere and the air in contact with the blood contained in the retort was interrupted. Any change, therefore, that might occur in the imprisoned air, would depend upon the action of chemical combination as no law either of absorption or of displacement could have any effect in bringing about the change; firstly, because the blood was in contact with a gas with which it had been previously saturated; and secondly, because the tension of the air contained in the retort was identical with that of the external atmosphere, under the pressure of which the saturation had been accomplished.

It is therefore clear, as we have stated, that any change occurring in

the air in the retort must be dependent upon chemical action between it and the blood; if no such chemical action took place, the air in the retort would remain entirely unaltered.



To return to our experiment. The retort, after having been repeatedly agitated, that the blood and air might be well mixed, was further laid on its side, in order to bring as great a surface of blood as possible into contact with the air. The temperature of the room where the experiments were made was always carefully noted, as it was found that temperature had a great effect in hastening or retarding the chemical action. After a certain number of hours (usually twenty-four, but sometimes no more than two, four, six, or perhaps eight hours, according as it seemed desirable to vary the experiment), the cork at *b* was carefully removed, under mercury, so that no atmospheric air could obtain admittance into the retort, and none of the gases operated upon could effect their escape. A tube (B), partly filled with mercury, was carefully adjusted to the retort by a well-fitting cork, *d;* the retort and its attached tube were now removed from the mercury trough, and into the free end of the caoutchouc tube a long, fine capillary tube of glass (C) was inserted. The end (*e*) was now dipped under the surface of the mercury in the trough, and the ligature on the caoutchouc tube at *f* removed; the mercury in the tube B immediately descended, forcing the atmospheric air out of the

tube C, the point of which (*e*), on the tube becoming filled with the gas which had been operated upon, was brought under an inverted eudiometer filled with mercury, and more of the same liquid poured into the tube B, until a sufficient quantity of gas had been obtained in the eudiometer. The retort and its appendages were then removed, and the collected gas subjected to analysis according to Bunsen's method.

From among our experiments,* we shall now select a few, which we consider to prove, in the most striking manner, that the oxygen of the atmospheric air cannot be brought into contact with blood without entering into chemical combination with one or more of its constituents.

A certain quantity of fresh ox blood was well agitated with renewed portions of air; and when thoroughly saturated with the gas, it was introduced into the retort, together with 100 per cent. of common air; it was then carefully corked up, and kept, during twenty-four hours, in a room of moderate temperature. That a fresh portion of blood might as frequently as possible come into contact with a portion of oxygen which had not yet been affected by its contact, the retort was, in the course of this period, frequently agitated, and kept on its side during the intervals. At the expiration of the twenty-four hours, the gas was carefully collected in a eudiometer, in the manner described above, and subjected to analysis. The gas was found to have the following composition in 100 parts:

Oxygen	10·42	total of oxygen	15·47
Carbonic acid	5·05		
Nitrogen	84·53		
	100·00		

Looking at the gas taken from the retort after twenty-fours' contact with the blood, we find its composition no longer identical with that of the common air which was introduced into the retort. Its constituents are materially altered; the proportion of some being considerably increased, while that of others has diminished in a manner no less marked. Ordinary air is said to have the following composition:

Oxygen	20·960
Carbonic acid	0·002
Nitrogen	79·038
	100·000

On comparing this analysis with the former one, of the gas acted upon by the blood, we find that 10·54 per cent. of oxygen has disappeared, while 5·05 per cent. of carbonic acid now exists where only a trace of its presence could before be detected. It thus appears that the blood has acted upon the oxygen of the atmospheric air—first, by combining a certain quantity of it with carbon, from one or more of its constituents, to form carbonic acid; and, secondly, a certain quantity of oxygen has perhaps been exhausted in the oxidation of some of its organic contents; for if we add the oxygen, combined with the carbon, in the form of carbonic acid, to the oxygen remaining free and unchanged in the retort, we find the sum only to amount to 15·47 per cent., instead of being 20·96 per

* While working in the laboratory of Professor Bunsen, at Heidelberg, we made upwards of one hundred analyses in the above-mentioned manner.

cent., as it ought to have been, if none of the oxygen was retained in the blood. Here it is observed, that 5·49 per cent. of oxygen is still to be accounted for. There can be no doubt but that it is contained in the blood; and the great question, therefore, now is, In what form does it there exist? Is it simply absorbed, or is it chemically combined? That the whole is not simply absorbed in the state of uncombined oxygen, can be distinctly averred; for as the blood, before having been brought into contact with the air in the retort, had already absorbed as much oxygen as it was possible for it to do, and since the saturation with that gas was accomplished under exactly the same pressure as it now experienced, it could not by any possibility absorb more of the same gas. The oxygen in the blood must therefore exist in another form. It may, by entering into chemical combination with some of the organic compounds of the blood, have directly oxidised them; or it may have combined with a certain amount of disengaged hydrogen to form water. But as we had no means of ascertaining this, in consequence of water being already present in indefinite quantity, we prefer, in our calculations, to leave this point for the present entirely out of the question. Again, it may, like the other portion of oxygen, have entered into combination with another quantity of the carbon in the blood, and have been retained in the liquid in the form of carbonic acid, by the pressure of the portion of the corresponding gas which had escaped in among the air in the retort, there exerting sufficient pressure to retain the remainder of the carbonic acid in the blood, in a state of mechanical absorption. This view is, however, untenable, as the volume of carbonic acid free in the retort scarcely equals the volume of the same gas which is supposed to be absorbed by the blood. What, then, can have become of the oxygen? The only other way in which we can attempt to explain the phenomenon, is by supposing that a part (not the whole) had entered into combination with some carbon from the organic substances in the blood, and was there kept in a state of mechanical absorption by the pressure of the carbonic acid diffused throughout the air in the retort, while another portion had combined with the blood to oxidise it. If the combination of oxygen with hydrogen to form water is left entirely out of the question, this certainly appears to us the most probable view; but in our own mind, we still incline to the opinion, that some of this oxygen, for the disappearance of which no direct explanation is furnished by the result, has combined with a certain amount of hydrogen to form water. Although we have as yet had no opportunity of proving this by direct experiment, still, reasoning from the circumstance that by each expiration we exhale a quantity of aqueous vapour which is supposed to have been produced in the blood, chiefly by a combination of the inspired oxygen with the hydrogen from the organic substances, we may assume the possibility of a similar phenomenon having occurred, unnoticed in the course of these observations.

Valentin and Lehmann assert that the quantity of azotised food exerts a powerful influence on the amount of urine passed, the hydrogen of the ingesta having combined with the inspired oxygen to produce water; and Böcker has shown the amount of urine passed to be uniformly in excess of the quantity of fluid taken. For example, he found that if 1260 grammes of liquid be taken, 2621 grammes of urine will be passed; if

3360 grammes be taken, 4994 grammes will be passed in twenty-four hours.

If the foregoing be the true explanation of the facts, it is seen that the constituents of the blood have become oxidised in two ways: firstly, by direct combination with oxygen; secondly, by the loss of carbon. Mulder's theory of the oxidation of protein substances may not, therefore, be so far from the truth as some authors have supposed; future investigations may yet impart to it fresh importance.

We shall here cite another of our experiments in corroboration of the above.

A quantity of defibrinated, fresh arterial blood from a calf was agitated with air during half-an-hour, until there could not remain the slightest doubt as to its thorough saturation with oxygen. As in the preceding cases, it was then put into the retort with 100 per cent. of atmospheric air. After standing for twenty-four hours, during which time it was repeatedly shaken, the gas was subjected to analysis, as in the previous experiment, and found to consist in 100 parts of the following proportions:—

Oxygen . . .	11·33	Total oxygen, 17·29.
Carbonic acid .	5·96	
Nitrogen . . .	82·71	
	100·00	

Here again, as in the example already given, a certain quantity of free oxygen has disappeared (= 9·63), and a great increase in the amount of carbonic acid has taken place (= 5·96). Although the proportion of carbonic acid is in this case greater than in the preceding one, the quantity of oxygen which has disappeared is still somewhat less; and if we add the free oxygen to the oxygen combined with the carbon in the form of carbonic acid, we shall find that the total of oxygen amounts to 17·29 instead of 20·96, as in air; so that 3·7 per cent. of oxygen has totally disappeared, and must, as we have before mentioned, have entered into chemical combination with the organic substances in the blood, and also with the carbon, to form a limited amount of carbonic acid, which, by the law of absorption, is retained in the blood. These two experiments, it will be observed, point to the same conclusions; and a number of others, where the mode of procedure was precisely analogous, and which were attended with similar results, have convinced us of the fallacy of the doctrine of Magnus, that the oxygen received into the blood during respiration is only mechanically absorbed into, and not at all chemically combined with that liquid.

It appears to us, from these experiments, that a portion of oxygen combining with some of the constituents of the blood to prepare them for assimilation, probably also enters into combination with some other of the effete products, in order to render them more fit for excretion. That this process of chemical combination is a slow one, and that it occurs gradually, is proved by the different amounts of air transformed. When, for example, the air was simply passed through a tube with a number of bulbs containing blood, which had been treated in the manner before mentioned, the quantity of air changed was very small. The analysis was as follows:—

Oxygen	20·520
Carbonic acid	0·921
Nitrogen	78·559
	100·000

A certain time is thus shown to be required for the development of the chemical changes.

An additional proof that chemical action occurs in the blood, is furnished by the fact that during digestion more nutritive material is absorbed into the circulation than is requisite for the support and development of the body, and that this excess is afterwards excreted in a different form from that in which it entered the system, without having ever become assimilated with the tissues. The transformation of these substances must therefore have occurred in the blood, and it is natural to suppose that the oxygen in that liquid would not remain entirely inactive during these chemical changes;—indeed, it is utterly impossible to account for the enormous quantity of carbonic acid which is daily expelled from the lungs, by any other assumption than that of the respired oxygen having combined with a certain amount of the carbon of these substances. Upon this supposition, Liebig founds his theory of the generation of animal heat.

It is well known that certain substances are formed in the circulation. Urea, for example, although secreted by the kidneys, is not formed by them. The researches of Prévost and Dumas have shown that, in the blood of animals whose kidneys had been extracted, a great quantity of urea existed, while only a trace of that substance could, before the extraction of the kidneys, be detected. In disease of the kidneys, the same thing has often been observed. We may therefore conclude that urea is not found in the kidneys, but only exereted by them.

To return to our experiment. It has been seen that the air in the retort underwent certain changes during its contact with the blood; the next point was to determine the number and identity of the substances by which these changes were brought about. With this object, the organic constituents of blood were successively subjected to the action of air, and treated by the process adopted in the case of the blood itself; it will presently be shown with what success. First, we repeated Scherer's* experiment on fibrin, taking care, however, not to let that substance remain in contact with the air above twenty-four hours. This precaution was adopted in order to obviate the objection raised by Magnus against Scherer's experiment—namely, that the fibrin had been allowed to remain in contact with the air until putrefaction had set in, and that consequently the changes which the air confined along with the fibrin was found to have undergone, were attributable to decomposition or putrefaction, rather than to any chemical action taking place between fresh fibrin and oxygen in the atmospheric air.

In our experiment, the fibrin, after having been in contact with air during twenty-four hours, appeared as fresh as at the moment of its first introduction into the retort; not the smallest symptom of putrefaction could be detected. The result of this experiment may therefore be con-

* Annalen der Pharm., Band xl. § 1.

sidered conclusive. The result corroborated the opinion expressed by Scherer, that fibrin has the power of absorbing oxygen and giving out carbonic acid,* as the following experiment shows.

One volume of fibrin (fourteen grains), slightly moistened with water, was placed in the retort along with eight volumes of air, kept at a temperature of from 20° to 25° per cent., and occasionally shaken during a period of twenty-four hours. At the expiration of that time, the gas in the retort was analysed, and found to have the following composition in 100 parts:—

Oxygen . . .	6·81	} Total oxygen, 17·98.
Carbonic acid .	11·17	
Nitrogen . . .	82·02	
	100·00	

Thus showing that the fibrin itself, exactly like the blood, takes up a certain quantity of oxygen, and gives off a stated amount of carbon in combination with oxygen, in the form of carbonic acid. The separation of the carbon may have occurred in two ways—either as carbonic acid, or (and this latter we consider the most probable supposition) as free carbon, which in its nascent state combined with some of oxygen present in the air to form carbonic acid.

Our next experiments were made on a substance which plays a still more important part than fibrin, at least, if we are to judge from its universal distribution throughout the animal economy. We allude, of course, to albumen. As this substance cannot be extracted from the blood in a pure and uncoagulated state, we were forced to avail ourselves of a substitute easily obtained in a nearly pure and liquid condition, and supposed to bear the greatest resemblance to the albumen of the blood—the white of the hen's egg. When a certain amount of albumen of fresh eggs was well agitated with renewed portions of air, and kept in contact during fourteen hours, at a temperature of about 26° per cent., with 100 per cent. of ordinary atmospheric air, 100 parts of the gas yielded on analysis—

Oxygen . . .	17·05	} Total oxygen, 19·14
Carbonic acid .	2·09	
Nitrogen . . .	80·86	
	100·00	

Proving, in common with the experiments on the blood and on fibrin, that albumen also possesses the property of chemically combining with oxygen, and giving off carbonic acid. The proportion of oxygen which has disappeared, and that of carbonic acid which has been formed, are somewhat less than in the case of the fibrin; but this difference would have been much less marked if the albumen had been allowed to stand for twenty-four instead of only fourteen hours in contact with the air.

* It was long ago pointed out by Spallanzani, as well as by Aldini, that muscular substance and several other of the animal tissues possess the property of absorbing oxygen and giving out carbonic acid. Recently these experiments have been verified by Mr. George Liebig, at least in as far as regards muscle; and Valentin has demonstrated how the lower extremities of a frog, when freed from the skin, absorb oxygen and exhale carbonic acid in definite proportion, as long as muscular irritability continues; and that when muscular irritability ceases, an important alteration takes place in the amount of the gases interchanged. (Archiv der Phys. Heilkunde, Band xiv. p. 2, 1855; Arch. Gén. de Médecine, Paris, Mai, 1856.)

As the serum of blood contains a large quantity of albumen, while, on the other hand, all the fibrin and blood-corpuscles occur in the coagulum, we instituted some comparative experiments between these two, and cite the following as the average of the results. Equal portions of coagulum and of serum, after repeated agitation with atmospheric air, were introduced into retorts, each with 100 per cent. of ordinary air, and during six hours kept at a temperature of 36° per cent. When that time had elapsed, the gas in each retort was subjected to analysis, and the results were found to be—

Coagulum—

Oxygen . . .	8·57	Total oxygen, 15·86
Carbonic acid .	7·29	
Nitrogen . . .	84·14	
	100·00	

Serum—

Oxygen . . .	16·74	Total oxygen, 19·04
Carbonic acid .	2·30	
Nitrogen . . .	80·96	
	100·00	

The difference in the results of these two experiments is very striking. The coagulum, which contained the fibrin and blood-corpuscles, wherein is a quantity of albumen, appears to have exerted a more powerful chemical action upon the oxygen of the atmospheric air than the colourless aqueous serum, which contains only albumen. This difference is perhaps more marked in consequence of the greater facility of saturating the serum with oxygen than in the case of the coagulum, which, even when pounded as fine as possible, is not in such minute division as the albumen dissolved in the serum. A greater difficulty is consequently experienced in saturating every part of it with oxygen, during its agitation with atmospheric air, before being introduced into the retort, than is found to occur with the albuminous serum. This is, however, in some degree, compensated by the circumstance that it is more difficult to mix the coagulum than the serum with the enclosed air in the retort. The effect of imperfect saturation may be looked upon as in a great measure counterbalanced by this last-mentioned fact. The difference in the amounts of air transformed in these two experiments was, however, so very great, that we felt exceedingly anxious to discover the source whence it proceeded. Under the impression that the presence of the hæmatin might have contributed to produce this result, some experiments were made on the latter substance, in the hope of obtaining a solution of the difficulty. It is now many years since a very distinguished French chemist, Monsieur Chevreuil, drew attention to the fact that sundry colouring matters used in the process of dyeing possessed the property of absorbing oxygen and giving out carbonic acid. Knowing that urohæmatin likewise possessed this property, as Scherer first observed, and also that Lehmann had obtained very similar results with his blood-crystals, we resolved on trying the effects of the pure colouring matter of the blood upon air. It was necessary, however, in the experiments on this substance, somewhat to modify the method of procedure adopted in those previously detailed,

as we possessed but a small quantity of pure hæmatin.* We cite the following experiment on this substance, inasmuch as it furnished the most striking results.

A portion of hæmatin, slightly moistened with water, was introduced into a glass apparatus furnished with a larger and a smaller bulb. The proportion of hæmatin to that of air was one volume of the former to about 1000 volumes of the latter; but as the measurement was made simply by the eye, this statement can only be considered as approximative. After the introduction of the hæmatin, the glass vessel was hermetically sealed, and hung up in the window exposed to the light during a period of nearly four months. The gas in the apparatus was then analysed, and contained in 100 parts—

Oxygen . . .	16·01	Total oxygen, 19·81
Carbonic acid .	3·80	
Nitrogen . . .	80·19	
	100·00	

Corroborating the different results obtained by previous observers on various colouring matters.

The pure colouring principle of the blood, therefore, by exposure to air, gives off carbonic acid gas, and becomes oxidised in two ways—firstly, by a loss of carbon; secondly, by direct combination with oxygen. These changes, moreover, take place to an enormous extent; for had equal volumes of blood-hæmatin and air, instead of only 1 volume of the former to 1000 of the latter, been employed, we may presume that a corresponding increase would have taken place in the amount of oxygen combined, and of carbonic acid disengaged; nor would it have been necessary to wait so long for a perceptible change in the composition of the atmospheric air confined in the retort. We were much gratified with the result of this experiment, as it furnishes additional evidence of the correctness of the theory we hazarded two years ago,† by which a more important office in the function of respiration than they before had been considered to possess, was assigned to the colouring matters of the animal and vegetable economy.

It must be obvious to the most cursory observer, that a close connexion exists between the distribution of the colouring matters in the animal and vegetable kingdoms, and the organs of respiration. In the animal body, for example, where the circulating liquid is the medium for the absorption of oxygen and the exhalation of carbonic acid, this liquid is rich in colouring principle. In plants, on the other hand, which are destitute of any proper circulatory apparatus, the colouring matter is found to be confined exclusively to the respiratory organs themselves (leaves, &c.). So indisputable, indeed, is the intimate connexion between the colouring matters and the respiratory process, that those parts of the plant in which no colouring matter is deposited, or which, on exposure to air, do not become coloured, entirely lack the property of absorbing

* This hæmatin we had prepared from ox-blood, according to the method of Verdeil, while working in his laboratory, three years before.

† Ueber Urohæmatin und seine Verbindungen mit Animalischem Harz. Verhand. der physik. Medicin. Gesell. zu Würzburg. 1854.

oxygen and disengaging carbonic acid. We do not mean to assert that the colouring matters are the only agents by which the function of respiration is accomplished in the animal and vegetable organisms; for our own experiments have demonstrated that other substances are not destitute of the property of absorbing oxygen and exhaling carbonic acid. But in our own mind, we cannot help associating the principal office of the colouring matters with the function of respiration; for, in our opinion, the blood-corpuscles, the recognised transporters of the respired gases, owe this property principally to the presence of the colouring matters, and not, as Liebig asserts, to the iron they contain.

It has been shown that time has a most important influence on the amount of oxygen absorbed, and the quantity of carbonic acid exhaled, by the blood; we shall now point out how temperature, as well as the presence of foreign substances—especially those having poisonous properties, exerts an equal power over the chemical changes induced by the presence of oxygen in the circulating liquid.

When two portions of the blood which had been thoroughly saturated with oxygen were confined with 100 per cent. of ordinary air, during twenty-four hours, one in a room of moderate temperature, the other in an ice cellar, the gas from the former yielded in 100 parts:

Oxygen	10·42
Carbonic acid	5·05
Nitrogen	84·53
	100·00

The latter, which had been kept surrounded by ice:

Oxygen	17·43
Carbonic acid	00·59
Nitrogen	81·98
	100·00

We have in these numbers a proof that a certain amount of heat is necessary for the development of the chemical changes.

To show the influence of foreign substances, we may cite the case of chloroform. When two equal portions of the same ox-blood, treated in a precisely similar way, were kept during twenty-four hours in contact with 100 per cent. of atmospheric air, the one in its normal state, the other mixed with three drops of chloroform, the analysis of the gas confined with the pure blood yielded, as already cited,

Oxygen	10·42
Carbonic acid	5·05
Nitrogen	84·53
	100·00

while that to which the chloroform had been added, yielded,

Oxygen	18·38
Carbonic acid	1·88
Nitrogen	79·74
	100·00

This proves that chloroform possesses the property of diminishing the power of the organic constituents of the blood to unite with oxygen, and give off carbonic acid.* Alcohol, as will be seen from the following example, has a similar power, although in a less degree. A certain amount of cow's-blood was confined with the same quantity of air, and treated in exactly the same manner as in the foregoing cases. After the expiration of twenty-four hours, the analysis of the gas confined with the pure blood yielded,

Oxygen	10·23
Carbonic acid	3·31
Nitrogen	85·46
	100·00

While that confined with blood, to which had been added 5 per cent. of alcohol, gave,

Oxygen	16·19
Carbonic acid	2·36
Nitrogen	81·45
	100·00

Many other poisonous substances possess the same power. The action of strychnine and brucine in this respect we have already pointed out,† and on an early occasion we intend offering the results of our analysis, proving that an exactly similar power is exerted by hydrocyanic acid, nicotin, ether, quinine, morphine, &c.

To conclude.—The foregoing experiments prove—

Firstly, That blood has the property of chemically combining with the respired oxygen.

Secondly, That the coagulum, the serum, fibrin, albumen, and hæmatin are among the substances possessing this property.

Thirdly, That these substances not only become oxidised, but also yield carbonic acid gas.

Fourthly, That time, temperature, and the presence of foreign matters, are among the agents which modify these changes.

While, however, we consider that our investigations have supplied what was wanting in direct evidence of the untenableness of Magnus's theory, we are not unconscious of the fact that the labours of some future inquirer may in due course overturn ours. So rapid is the advance of physiological science, that the theory regarded as true to-day, may be recognised as false to-morrow. The facts, however, on which the theory is based, if rightly observed, remain unaltered and unalterable.

G. Harley.

* Dr. C. F. Jackson on analysing the blood in the case of a woman poisoned by chloroform, found that the chloroform had become changed into formic acid, which he separated by distillation. The blood, by combining with the chlorine, had lost the power of coagulating and becoming red on exposure to the oxygen of the air. From the latter observation it appears that chloroform exerts the same power over the blood in as it does out of the body. See Comptes Rendus, Feb. 25th, 1856.

† Lancet, June 7th and 14th, 1856.

Review XII.

The Trial of William Palmer, at the Central Criminal Court, Old Bailey, London, May 14, *and following days*, 1856.

It was in the latter part of last November, that public attention was first drawn to the case which furnishes the subject of the present article, by an announcement in a local paper, that a young man named William Cook had died at Rugeley, under circumstances so suspicious as to call for an inquest; and that, as the result of that inquest, a verdict of Wilful Murder had been returned against William Palmer, a surgeon of that place, who was accordingly committed for trial. Little did any one then suspect, that the drama thus opened would speedily attract the attention, not only of all England, but we may almost say of the whole civilized world. Yet it was not long ere the single crime was amplified into a catalogue so monstrous, as to cause William Palmer to be ranked among the most terrible poisoners of any age or country; and the particular case which had given occasion to the investigation, thus acquired an importance in social estimation, which seemed almost to rival that of the great public events which were contemporaneously enacting.

How far this catalogue is correct, whether it included less or more than the truth, is known to no mortal being. For ourselves, it will be enough to state that the evidence brought out on the inquest as to Palmer's complicity in his wife's death seems to us morally conclusive; and that though we are not so sure that he gave his brother the *coup de grâce* by any special dose of poison, yet it is quite clear to our minds that he was doing his best to compass his death by the slower process of habitual intoxication, and that he would have finished him more speedily had he found occasion to do so. On these points there has been a public investigation and a public verdict, and we are therefore justified in expressing a decided opinion. In regard to the cases which have not been so gone into, we have nothing but hearsay evidence for our basis; and all that we can say of this is, that taking it in its connexion with the proved cases, it affords a strong presumption of his guilt in several more.

A juridical investigation of so remarkable a character ought not, as it seems to us, to pass without some special notice on our part; and there are two subjects on which we think that some comment is specially called for, quite independently of the important questions of chemical toxicology with which we do not at present propose to grapple.

The first and principal topic to which we are desirous of directing the attention of our readers in connexion with this remarkable trial, is the *probative value of circumstantial evidence.* This, we are prepared to affirm, *may* rise to the full force of direct proof; and when the uncertainty attending on all *testimony* is taken into the account, we hold that even a stronger conviction may be afforded by circumstantial than by direct evidence. We doubt if the annals of criminal jurisprudence afford any more remarkable example of the overwhelming force which arises from the concurrence of a number of independent probabilities, of which every one, taken by itself, might bear some other explanation. To com-

plete the proof that strychnine administered by Palmer to Cook was the cause of the death of the latter, to the satisfaction of every unprejudiced mind capable of estimating the circumstances, but one point was wanting, —the discovery of the poison in the body of the deceased. Had this been detected, the only ground of cavil would have been removed; and not even those most interested in procuring the prisoner's acquittal, could have had the hardihood to protest his innocence. As it was, even in spite of this unfortunate deficiency, and of the attempts which were perseveringly made to convert this absence of an important probative fact into a positive *dis*proof, which we shall presently show that (under the circumstances) it had no right to be designated, we doubt if the slightest doubt of Palmer's guilt existed in the mind of any bystander who steadily followed the course of the proceedings, and carefully noted the important points of the case, save in the case of such as (from whatever motive) did not *wish* to believe him guilty, and allowed their feelings to warp their judgment. And notwithstanding this serious drawback, we hold that the evidence against him was really much stronger than if, without any adequate confirmatory testimony from independent sources, a single witness had deposed to having actually seen Palmer mix strychnia with the pills which he administered to his unfortunate victim, and had thus furnished what would be commonly regarded as the only *direct* proof of his guilt.

Before proceeding to justify our assertion by a reference to the principal features of this particular case, we shall beg the attention of our readers to a few general considerations as to the essential nature of *proof*, and the probative force of different kinds of evidence. In these we shall present, under a somewhat different form and with different illustrations, a principle on which we enlarged on a previous occasion (vol. vi. p. 1); and on which we deem it the more important to insist, since it is that on which the Physician and the Chemist are constantly acting without any definite appreciation of its value, and also because, although it is not recognised (that we are aware of) in any of our formal treatises on logic, we are able to appeal for confirmation of its correctness to some of the most eminent logicians of the day, who have given their full sanction to the views we formerly advanced.

It may seem no better than a truism to say, that the probative value of all evidence depends upon the strength of the conviction which it is capable of producing in the human mind, as ordinarily constituted; yet upon this truism the whole science of evidence rests. We can no more define what constitutes an intellectual assent to a certain proposition, than we can define what constitutes the sense of beauty that is awakened by a certain external object, or explain why certain objects produce either, whilst others do not. There is a state of mind which varies in intensity from *absolute certainty* down to a mere *preponderating belief*. In the first case the mind cannot entertain, as even possibly true, any other hypothesis than that to which it gives its assent; whilst in the second, it merely gives a preference to one hypothesis as more likely to be true than another, or perhaps than several others, each of which may possibly be true, while some of them may appear not altogether improbable. Conversely, there are certain ideas, or combinations of ideas, which, when present to the mind, excite in it the state in question, either as to themselves, or as to

some other idea, of which they are said to furnish the evidence. The degree of intensity in which that state shall be excited, in any particular case, doubtless depends, in some degree, upon the antecedent training of the individual. What is all but demonstrative evidence to one, may be entirely destitute of probative force to another. The Chemist can express a positive assurance of the presence of a substance whose characteristic reactions he has witnessed, when an unscientific bystander can only bear testimony to having seen a succession of phenomena which are to him altogether meaningless. Nay more, one chemist (as we shall presently show) will feel himself justified in expressing a positive assurance, whilst another with equal, or even greater chemical knowledge, will only draw a probable inference from the very same data, because his previous logical training has not been such as to lead him to recognise the probative value of those data. So, again, the Toxicologist sees the unmistakeable proof of the action of a corrosive poison, in morbid appearances which, to the mind of an ordinary observer, would possess no such significance. There are, however, certain kinds of evidence, which make their appeal, not to the individual consciousness of the expert, but to the common sense of mankind; and it is only of that assurance which is felt by every ordinarily-constituted mind, as to the ideas which these evidentiary facts call-forth in it, that *absolute certainty* can be rightly predicated. And it is further to be noticed, that this absolute certainty can only be felt regarding certain abstract ideas which are of the mind's own coinage; since, as soon as we begin to rely upon the "evidence of our senses," with regard to matters external to it, elements of uncertainty begin to creep in, which weaken the probative value of even the best-observed facts; and when, in addition, we have to rely for our knowledge of the facts, not upon the evidence of *our own* senses, but upon the testimony of another as to the impression made upon *his*, that element of uncertainty is still further augmented. Thus no one who duly weighs the fallacies of sense to which every human being is liable, as shown in the diversities in the account given of the very same occurrence by a number of truth-telling witnesses, would venture to say that he has the same positive certainty respecting any event that has fallen-out under his own eyes, which he entertains in regard to the axiom that "if equals be added to equals, the sums will be equal." He would feel that he *may be* mistaken (however improbable he may consider it that he should be) respecting the one; but that he *cannot* be mistaken respecting the other. He can conceive something else to have really occurred, than what he believes himself to have seen or felt; but he cannot conceive that if equals be added to equals, their sums should be anything else than equal. Again, whatever confidence we may entertain in the veracity of another, even to the extent of staking upon it everything we ourselves hold dearest, we cannot predicate of any fellow-mortal the absolute impossibility that his testimony should be intentionally deceptive; and further, we are of course more ready to believe that *he* may be *self*-deceived, than to admit that *we* can be. Hence, even with regard to the data on which every fabric of proof has to be built-up, there is a fundamental distinction to be drawn, between those that are necessarily or absolutely true, and those that are only contingently true; and it will be found that under the former category can only be ranged

our conviction of certain abstract truths, which (like the axioms of Geometry) we believe, because we cannot help doing so; whilst the latter includes every event of our outward life, even such as we are accustomed to speak-of with the most positive assurance.

The same distinction applies to every inference based upon these fundamental data. There are certain inferences which approve themselves to every ordinarily-constructed mind as necessarily true, because it cannot conceive either the contrary, or anything else, to be in the remotest degree possible. Hence every one of these inferences becomes a secure basis for the next; and thus, however prolonged our chain of reasoning may be, if every link possess this absolute tenacity, the conclusion is so firmly held-on to the premises, that we can no more admit any possible doubt of the former, than we can of the latter. Of this kind of reasoning, mathematical demonstration is the typical example; affording, in fact, almost the only case, in which—the premises and the inferences being alike *necessarily* true to our minds—the conclusion becomes forced upon us as a certainty which cannot be evaded. To any kind of reasoning, indeed, in which the requirements of logic are absolutely satisfied, the term *demonstrative* is commonly applied. But it very commonly happens, that whilst the deductions are soundly made, the data from which they are inferred contain some elements of uncertainty; or, to state the matter in the ordinary language of the science, the syllogism may be perfectly good, but the conclusion is vitiated by some want of soundness in one or both of the premises; hence to speak of such a proposition as demonstrated, is a misuse of terms, since this designation should be reserved for cases in which both the data and the inferences deduced from them are alike free from the possibility of fallacy.

Now, to show how little the most approved verities of science can be considered as rising to this degree of certainty, let us refer to Chemistry for illustrations.

If we develope a blue colour in some vegetable structure by the contact of iodine, we feel as positive an assurance as that science can afford, that *starch* is present. Or, supposing that to a suspected fluid we add a little hydrochloric acid and gold-leaf, and that afterwards, on dropping-in some protochloride of tin, we get a purple precipitate, we feel an equally strong assurance that nitric acid was present. But in the first case, our conviction is based on the assumption that iodine produces a blue colour with no other substance than starch; and however justifiable such an assumption may be, as accordant with all we at present know, it is in the nature of things unquestionable that some other substance *may* be discovered which shall give the very same reaction. Such, indeed, happened in the case of meconic acid; the deep red which that substance gives with the perchloride of iron having been considered an infallible test of its presence, until it was discovered that sulphocyanogen gives a colour with the same reagent, only to be distinguished from that given by meconic acid by the circumstance that the one is removable by a solution of bichloride of mercury, whilst the other is not. In the second case our conviction is based on two such assumptions, each of which contains the same element of uncertainty; for, although we know nothing save gold in solution, which will give a purple precipitate with protochloride of tin,

still we cannot but admit the possibility that there *may be* something else; and although we know nothing save nitric acid, which, when added to hydrochloric acid, shall dissolve gold, we must again allow that there *may be.*

We are far from wishing to encourage a spirit of undue scepticism. All we are desirous of showing is, that even what we are accustomed to consider to be the most positive and direct evidence of objective realities, is subject to possibilities of fallacy, which reduce them from the category of *necessary* to that of *contingent* truths. They are still *realities* to us; and the common sense of mankind feels itself fully justified in acting on them, until their remotely-possible fallacy shall have been shown to be a real one. What we have now to urge, is that *the same degree* of conviction may be rightly attained from a concurrence of independent probabilities, each by itself (it may be) but a slight one, as from the evidence to which we are accustomed to attach the highest probative value. The test of the value of any assumption really lies (as we have seen) in the answer to the question, Can the contrary, or anything else, be conceived to be possible or probable? And we shall show that, when tried by this test, the conclusion to which circumstantial evidence points, may present as high a value as that afforded by the evidence we should consider the most "direct."—We shall again have recourse to Chemistry for an illustration. We have a suspected fluid, in which, on adding a few drops of ammoniated nitrate of silver, a yellow precipitate is thrown down. Again, on causing the flame of hydrogen gas disengaged in the same fluid to impinge on a piece of porcelain, a metallic crust is formed. We may hence infer the presence of arsenic with a high probability, though not with the degree of certainty that the case admits of. The inference from the first fact is by itself of little probative value; since there are various substances beside arsenic, which will give a yellow precipitate with nitrate of silver. And as antimony, like arsenic, will combine with hydrogen disengaged in its solution, and will form a metallic crust on the porcelain against which its flame is projected, there is an even chance that antimony may be the substance. Still if, from the same solution, we get *both* these results, we feel a strong probability that they are due to arsenic; since there is no other substance known to us, which shall give both the yellow precipitate with nitrate of silver, and the metallic crust when reduced from hydrogen. Of the various substances which give the former reaction, there is not one save arsenic that will give the latter; and antimony which alone, besides arsenic, will give the latter, does not give the former. Hence if we can be assured that it is *one and the same substance* that produces both reactions, we may feel the same strength of conviction of that substance being arsenic, and nothing else than arsenic, which we have of starch being present when a blue is produced by iodine. And we extend this principle to the liquid tests, which, if looked-at separately, are rightly considered as so fallacious that no reliance can be placed upon them. For the green precipitate given by arsenic with ammoniated sulphate of copper, and the orange-yellow with sulphuretted hydrogen, are, like the yellow with nitrate of silver, so far imitable by the reactions of other substances, that neither, taken by itself, can be regarded as affording more than a faint probability of the presence of arsenic. But as no substance known to us, save arsenic, which gives any one of these precipitates, will give either of

the two others, the only hypothesis we can entertain as possible, save that of the presence of arsenic in the liquid which exhibits these reactions, is that of a mixture of the substances which shall give each separately. This of course involves the highest scientific improbability, though not an impossibility; but even this chance of error may be excluded, by taking experimental means to show that it is *one and the same substance* which produces all the reactions.—Thus, to go back to the first case, if the metallic crust be volatilized in contact with air, it will rise in a white vapour which will condense again in octohedral crystals; and if these be dissolved, the solution will give the characteristic reactions with the liquid tests. Thus the hypothesis of antimony as the source of the metallic crust is excluded, first by the volatility of that crust, and second, by the reactions of the product of its volatilization; and the hypothesis of phosphoric acid, or any other substance than arsenic, as the source of the yellow precipitate with nitrate of silver, is excluded by the previous reduction of the precipitant to the metallic form from a state of gaseous combination. So, again, from the use of the liquid tests without any reduction of the metal, we hold that an equally high degree of certainty may be obtained, by taking care to exclude the hypothesis of mixture; and this can be readily effected by causing *the same substance* to give each reaction, as may easily be done by separating and redissolving the precipitate given by one of these tests, and then treating the solution with the other two. To any one who is capable of appreciating the probative force of evidence, such a use of the liquid tests ought to be quite as satisfactory as the reduction of the metal; since the production of the three, or even of any two, of their characteristic reactions, cannot be accounted-for (according to the present state of our knowledge of chemistry) on any other hypothesis than the presence of arsenic.

Thus, then, whilst the Chemist can recognise one substance by a single test, which he considers as affording direct evidence of its presence, *because he knows of no other substance which will give the same reaction*, and therefore cannot attribute that reaction to any other cause of which he is cognizant, he may recognize another with equal certainty by the use of two or more tests, each of which may be utterly inefficient *per se*, but of which the *aggregate* affords evidence no less direct than that in which he justly confides in the preceding case, *because he knows of no other substance which will give the same combination or succession of reactions.* Practically, our principle is admitted and acted-on by every Chemist; but that its true range is but little understood, is evident from the very slight estimation in which the liquid tests for arsenic are held when taken alone. Doubtless in a criminal procedure it is quite right to require every proof that science can afford; and the reduction-test can now be so easily applied, that none but the most ignorant and bungling operator could fail in its use. But cases have happened, and may happen again, in which the liquid tests having been used with success, but the arsenic not having been reduced, the presence of arsenic has been considered as *not proven*, on the ground that as each of the liquid tests is *per se* fallacious, even the combined result of all has no claim to afford such an assurance as is needed for conviction. Such assurance will be felt, however, in this and similar cases, by any competent inquirer who shall put

to himself this question,—"Is there any other substance than the one supposed, which fulfils *all the conditions* of the case?" If there be not, the fact is as clear as if the presence of that substance had been demonstrated (to use the current phrase) by the most conclusive single test.

Precisely the same method of reasoning is continually had recourse to in Medicine, especially in diagnosis; and its validity is practically recognised, though without, as we believe, a clear comprehension of its *rationale*. A certain peculiar group of symptoms is presented by a patient, from which the Physician endeavours to determine the malady under which he labours. Every one of these symptoms, taken by itself, may be conformable to half a dozen different diseases, and may afford no special probability in regard to either one of them. But of these diseases, a large proportion may be at once excluded by their incompatibility with other symptoms; and there may be only two or three, which, on a general view of the case, appear to give any rational account of its phenomena. And among these two or three, a choice may very possibly be made at last, by attention to minute details which did not enter into the previous survey, these details being found inconsistent with all the hypotheses but one. And although, as in Chemistry, we are bounded by the imperfection of *all* our knowledge of the external world, yet it may be safely said that a diagnosis based on the concurrence of a number of separate probabilities, *the aggregate of which is compatible with only one conceivable hypothesis*, is really just as secure, and may be considered as just as much demonstrated, as a diagnosis that rests on the most satisfactory pathognomonic sign that nosology can present. As in the second case no other disease than one can be conceived to exist, when its single pathognomonic sign is unmistakeably present, so in the first no other disease than one can be conceived to exist, when a combination of symptoms is present which is consistent with *its* existence, whilst some symptom or other is incompatible with the idea of *any other* malady with which we are acquainted.

Hence in considering the probative value of a mass of circumstantial evidence, such as was adduced in the trial of Palmer, we are not to be decided by the separate weight of every isolated fact, but by that of the aggregate; and not merely by the sum of the individual probabilities, but by the consideration of the force which they acquire from their mutual connexion. Thus every fact adduced against Palmer, might possibly have been explained-away on the hypothesis of his innocence; the aggregate of these facts, taken separately, might not constitute any overwhelming proof of his guilt, unless the several explanations given of them were inconsistent with one another; but it is when they are considered in their mutual relations, that they acquire a probative force, which, in our apprehension, nothing can withstand. Without going into such detail as our readers' knowledge of the circumstances would render superfluous, we shall briefly indicate those points which seem to us to possess the greatest cogency.

Let us first take the fundamental question, whether Cook died from the effects of strychnine administered to him. The medical evidence of poisoning is usually referable to three heads; that of the symptoms, that of the post-mortem appearances, and that of the presence of the poison

in the body. In the case of poisoning by strychnine, however, no reliable evidence is furnished by the post-mortem appearances; and in this individual case, no affirmative evidence was supplied by chemical analysis. But the evidence of symptoms is peculiarly strong. We know of no cases, in which, from the history of the symptoms alone, a more certain inference can be drawn as to their origin, than it can be in such as exhibit the phenomena of strychnine-poisoning in its most characteristic form. Putting aside all quibbles as to the minor variations which a comparison of the history of almost any two individual cases would present, the fact stands-out strongly, that death from strychnia is in its essential nature death from tetanus. Now tetanus is a disease so peculiar, as to be altogether unmistakeable for anything else; and moreover it is one whose different forms are marked-out with singular clearness by the course they take. Thus idiopathic tetanus, a disease so rare that many surgeons in extensive practice have never seen a case of it, is distinguished by the gradual nature of its access and by its protracted duration; traumatic tetanus is recognised by the previous existence of some wound or sore, whose situation or condition renders it liable (as experience shows) to give rise to this disease, and by the more rapid course of the malady, which sometimes terminates fatally in this country within twelve or fifteen hours, and *is said* to end occasionally in hot climates within an hour; while hysteric tetanus, to which in the suddenness and violence of its access the tetanus of strychnia bears the closest resemblance, is diagnosed by the previous hysterical diathesis of the subject, who is almost invariably a female. The tetanus of which Cook died—for to call it anything else would be a piece of disingenuous casuistry—was certainly not idiopathic, for the attack did not last above twenty minutes. It was certainly not traumatic, for neither did any wound or sore exist that could afford the requisite source of irritation, nor could any parallel be adduced from reliable experience to show that, even had such a possibility existed, the fatal event could have supervened within so short a time from natural causes. It was suggested on the defence, that the non-fatal attack on Monday evening and the fatal attack on Tuesday evening were parts of the same malady, the duration of which was thus about twenty-four hours; but this hypothesis was quite disposed-of by its entire inconsistency with the uniform history of traumatic tetanus, the idea of any such remission, after the paroxysms had once become violent, being utterly opposed to experience. We should therefore be obliged to treat the first and the second attacks as two separate and independent maladies, unless they could be shown to be possibly attributable to an *hysterical* condition of the system (in which, within our own experience, tetanic attacks have thus suddenly come-on at long intervals, with complete remission between); but of this there was not the faintest shadow of a probability.

But although the inference that the tetanus of which Cook died was attributable to administration of strychnia, mainly rests upon the incompatibility of the symptoms with any form of natural disease known to medical experience, this is by no means the only evidentiary fact bearing on the question; and it is a pure sophism to urge, as Palmer's defenders have done, that the charge against him, resting on the evidence of symptoms alone, is sufficiently disproved by the non-detection of the

poison in the body. We are not going to enter into any discussion of this part of the case, nor to inquire whether Drs. Taylor and Rees ought to have detected strychnia, if it existed, and were bunglers for not having done so. Without setting ourselves up as the apologists for those gentlemen, however, we think it right to point out the essential difference between the position of one analytical chemist, who simply receives a very limited amount of material, in which he is expected to search for every conceivable poison without the slightest clue from symptoms or post-mortem appearances as to the direction most likely to be fruitful, and that of another who applies all his skill and all the resources of his art to the detection of some one particular substance for which he is eagerly looking. It would have been no reflection on Drs. Taylor and Rees that they did not find strychnine in the stomach, even had they received the entire contents of the viscus, instead of a small fraction of them; for it may very probably have not been present there. And although it certainly ought to have been looked-for in the blood, after the evidence of symptoms became known; yet it was no fault of Drs. Taylor and Rees that it was not, since they never received any blood for analysis. The absence of any chemical evidence as to the presence of strychnine, is simply a deficiency of proof of the affirmative proposition, and affords no presumption whatever to the contrary. For not only was it stated by Drs. Taylor and Rees, that by the use of the very same methods they had failed to detect strychnia in the bodies of some of the animals which they had poisoned by that substance, but the like admission had to be made by some of the witnesses for the defence. To urge, therefore, that Cook did not die of strychnine, because none was found in his body, is tantamount to urging the monstrous proposition, that of the rabbits to which strychnine had been administered, and which died with all the symptoms of strychnine-poisoning, those were not killed by it, in whose bodies it could not be found after death.

But the want of full proof on this point, is most singularly supplied by the evidence as to the administration of the strychnine. The sufferer had two distinct attacks of tetanus, of a kind not capable of being accounted-for in any other way than on the toxic hypothesis. Each of these comes-on within an hour after Cook had taken pills, with which it was distinctly proved that Palmer had, on the first occasion, the opportunity of tampering, and which on the second occasion were brought by himself. Scarcely an hour before the first occasion, Palmer had purchased strychnine, if the witness Newton is to be believed; in the course of the next day, between the first and second occasions, he made another purchase of strychnine at a different shop. Now, whatever doubt may be considered to rest on the testimony of Newton, taken by itself, from the circumstance that this part of it was kept-back by him in the first instance, we hold that the *mutual bearing of these four asserted facts*—the first purchase of strychnine, immediately followed by the first tetanic attack, and the second purchase of strychnine, followed by another tetanic attack at the earliest opportunity at which the dose could be administered—is such as not only to give them a probative force, taken in combination with each other, vastly greater than the sum of their independent or separate values, but goes far to remove any doubts that might be

entertained on the score of possible errors of testimony. For it is obvious that the second purchase of strychnine confirms the first; and that the relation between the fatal attack of tetanus and the second purchase becomes an almost positive certainty, when taken in connexion with the like occurrences of the preceding night. Each circumstance so confirms and is confirmed by the rest, that the whole may be likened to a framework of which the several parts are so braced together as to afford a degree of strength equal to that of a solid mass, its weakest parts being so secured by their connexion with the strongest, as not to be in any more danger of giving way than they are.

In many cases of poisoning, the question whether the death of the deceased was attributable to poison, and the question who administered the poison, are entirely distinct. Here they are not so. The evidence that Cook died from strychnia is partly furnished by the fact that Palmer had purchased strychnia immediately before; and not on one occasion only, but on two. The evidence that the poison was administered by Palmer rather than by any one else, is partly based on the fact of his possession of it without being able to give any probable account of his object in purchasing it, partly on various little circumstances connecting him with the act—such as his going home for more than half an hour on the Tuesday evening, after having received the pills from Mr. Bamford—partly on the uncontradicted proof of the previous administration of antimony, and partly on the collateral circumstances which showed a motive for the act, which, to a man of Palmer's nature, was of overwhelming force. If we could stop to analyse the first of these sets of evidentiary facts, we could here again show how forcible may be the proof derived from a number of minute and insignificant circumstances, when they are considered in their bearing upon the one simple hypothesis in question, and how numerous and complicated must be the inventions which would be required to explain them, if this hypothesis be not admitted. But as this could only be done by such a minute detail as would be foreign to our present purpose, we shall pass on to the second portion of the case—namely, the previous administration of antimony to the deceased. This is an almost unprecedented feature in the history of juridical inquiry; and presents a most remarkable significance, when taken in connexion on the one hand with the subsequent administration of strychnia, and on the other with the very peculiar nature of the collateral transactions. No one, we should suppose, who considers in their connexion all the facts of this preliminary part of the case—the repeated and urgent vomiting of Cook, unconnected with any other symptoms of disease that could reasonably account for it, the repeated recurrence of this vomiting shortly after broth and drinks had been taken, the occurrence of the same disorder in one of the attendants who partook of one of these articles, and the proved presence of antimony in the deceased's body, can entertain any doubt that Cook's vomiting was due to antimony then administered. And when not only the ordinary opportunities which Palmer had of introducing any such substance into Cook's food or drink, but the peculiar anxiety which he showed that these articles should pass through his hands, are taken in connexion with the observation by Mrs. Brooks, who caught him almost in the fact of

mixing something with the brandy and water which shortly afterwards brought on vomiting; when, also, we see the very extraordinary advantage that was taken by Palmer of his victim's illness, to get into his own possession the large sum of money which Cook was to receive; no reasonable doubt can be entertained, that Palmer's was the hand by which the antimony was administered. His defenders, indeed, seemed to be quite aware that it would be a waste of energy to attempt to impugn this part of the case; they scarcely urge anything else than a denial that it has any bearing on the subsequent occurrences.

This bearing, as we have just said, is twofold. Supposing that Palmer had made up his mind to poison Cook with strychnia, as a substance of potent and certain operation, capable of being employed with but little chance of detection, the first question would be, how he should administer it. The intense bitterness of strychnia would effectually reveal its presence in any article of food or drink; the only mode of getting Cook to take it, therefore, would be to make it up into pills. But how could Cook be brought to take these pills, unless he were first made ill in some other mode? The administration of antimony furnished a ready means of bringing this about; and from the time the poor victim was once prostrated by sickness, he was within the clutches of his destroyer. But further, it would not suit Palmer's purpose to kill Cook outright. If he had poisoned him when he first made him ill, he would probably have never had it in his power to get in the debts due to Cook, and to apply these to his own purposes. The Monday on the evening of which the first attack of tetanus came on, was settling-day at Tattersall's. Cook would naturally have gone to town to receive the large amounts due to him; but he is laid-up by illness, and his friend Palmer goes in his stead, represents himself as Cook's agent, collects the bets due to him, and then, instead of bringing home the money to his client, applies it to stopping the mouths of his own most urgent creditors. Having succeeded in this, the sooner Cook was put out of the way, the better would it be for himself. Accordingly he loses no time; for immediately on his return from London, he obtains strychnia, and administers it that very night. This attempt not being successful, another purchase was made, and a second dose administered the next day; and then Palmer thought that he had succeeded. And so in truth he did, in his immediate object; but Nemesis soon appeared upon the scene; and the villain who had hunted-down his too-confiding friend, became in his turn the object of such an unwearied and determined pursuit, as tracked him through all his subtle evasions, unmasked his most secret doings, and presented to the world such an aggregate of infamies having their climax in this one act, as—to the credit of human nature be it said—can scarcely be matched in the annals of jurisprudence.

In speaking of the previous administration of antimony, we have been obliged to advert—so mutually intertwined are all the main threads of this inquiry—to the purpose which may fairly be imputed to the prisoner, and the motives which present themselves for his crime. The history of his previous transactions makes it evident, that he was fully conscious that not only ruin but punishment was immediately impending over him, and was only to be averted, even for the moment, by the possession of the

means of staying the proceedings of his most urgent creditors. For not only had he involved himself in debt far beyond any power of self-extrication, but he had committed repeated forgeries, the exposure of which was inevitable, unless the bills to which they were attached could be taken-up before being presented for payment. Had he so failed in carrying-out his scheme, as never to have touched a farthing of Cook's money, still the presumption would have been strong that he intended so to act, and the murder would have been sufficiently accounted-for. But the case does not stop here: for as he effectually did that, the intention to do which would have constituted a sufficient explanation of his motives, he converted a presumption into moral certainty; and by appropriating Cook's money at the particular juncture in question, he afforded just the same kind of presumption of his murderous design, as would be fairly drawn in the case of a highwayman, who might be taken in the act of rifling of his property a man who had just fallen from the wound of a bullet fitting a pistol carried by the robber.

These are, in our apprehension, the most prominent among the antecedent facts of the case; but they are by no means the only ones. In regard to the subsequent facts, it will be sufficient to refer to Palmer's obvious desire to manage the funeral himself, to the resentment he showed at the interference of Mr. Stevens, to the manner in which he conducted himself at the post-mortem examination, so as to prevent the full contents of the stomach from being transmitted, to the attempt he made to bribe the post-boy to upset the vehicle in which Mr. Stevens was carrying the jar to London, and to his tampering with the post-master and coroner, as all having a marked significance when considered in connexion with each other and with the hypothesis of his guilt, whilst, if not absolutely irreconcilable with the notion of his innocence, they require such explanations as have assuredly not been given.

Thus, then, what we have already designated as a *framework* of evidence, is strengthened by such a variety of additional braces and supports, that it may be pronounced to be absolutely immovable. Some of these may be weak, but the others are strong. Some may even be rotten, but the rest remain as they were. Take away all the slighter parts, the strength of the whole is but little impaired. Remove even one of the principal beams (such, for example, as the first purchase of strychnia), the loss is scarcely felt, so completely is its function performed by the accessory parts. Look at the case in every light, and there is not a single difficulty or inconsistency on the hypothesis of Palmer's guilt; every fact is at once explained; every one of his proceedings has its appropriate meaning. But on the hypothesis of his innocence, such an aggregate of makeshifts and inconsistencies, of gratuitous suppositions and improbable assumptions, become necessary, as no one would for a moment contemplate in any other case. It is only where a man's life is at stake, that we even think it necessary to examine into their value; in any ordinary investigation, we should scout such an alternative as altogether inadmissible.

Our first position, then, is, that the real inquiry in any case of "circumstantial evidence" is not into the separate probative value of individual facts, but into the probative force of the collective aggregate. The probability deducible from each of them taken by itself, may be so slight as

scarcely to deserve to be accounted one. And yet a small group of such probabilities may suffice to afford a firm conviction. For, to revert to the case of the liquid tests for arsenic, even if it were a hundred to one that the precipitate by each were something else than arsenic, yet if nothing but arsenic could give all three precipitates, or even any two of them, their concurrence would afford as high a certainty as any chemical proof could furnish. We have simply to ask ourselves the question, "What other hypothesis is accordant with *all* the facts of the case?" and when no other can be conceived which is self-consistent and complete, we are as much bound to accept the charge as proved, as if a reliable witness had actually seen the crime committed. The proved fallacies of circumstantial evidence are often urged, especially by those who find themselves incriminated by it; but in all the instances referred-to, there was some other hypothesis open, and the question lay between the more and the less probable. In this trial, we affirm that the question lay between the morally-proved and the morally-impossible; and so both judge and jury seem to have felt.

But we go further, and say that we consider the proof, in such a case as this, to be actually more complete than if it rested on the most direct testimony, this testimony being unsupported by collateral evidence. For, making use of the test already prescribed, we find that, in such a case, the answer to the question, "What other hypothesis can be entertained?" might be manifold. The witnesses may either be mistaken as to the facts, or they may be wilfully mis-stating them, either from spite against the prisoner, or to shift the responsibility from the real culprits, who may either be themselves, or some parties for whom they are interested. Numerous cases of this kind are on record; and the hypothesis is one which should always be canvassed, when the case mainly hangs upon the evidence of one or two witnesses. Generally speaking, however, there is some collateral evidence which supports the proof which the testimony of the principal witness, if reliable, has afforded. This was pre-eminently the case, our readers may recollect, in the trial of Dr. Webster, one of the principal witnesses against whom was Littlefield, the porter of the Medical School; and although it was urged by Dr. Webster that Littlefield was the real culprit, and had contrived some of the most inculpating pieces of evidence (such as the finding the parts of Dr. Parkman's body in the privy-vault of Dr. Webster's laboratory), yet there were so many facts which this hypothesis did not in the least account-for, and so many more to which it was entirely opposed, that no one unconnected with the defence seems to have entertained it for a moment; and Dr. Webster, before his execution, asked Littlefield's forgiveness for having made this charge against him. Now, it is one of the most singular features in Palmer's case, that the evidence is drawn from such a variety of sources, as altogether to forbid the idea of any considerable error, either from accident or design; every part of the case mutually supporting, and being supported by, every other part. We must suppose so large a proportion of the witnesses to have forsworn themselves, to make the case other than it presents itself, that, considering the mutual independence and previous characters of these witnesses, such a supposition is altogether inadmissible. Suppose that Newton did forswear himself in

testifying to the purchase of the strychnia by Palmer, on the Monday, this does not weaken the proof that he purchased strychnia on the Tuesday, or that on both evenings Cook suffered from a form of tetanus only attributable to strychnine. And even supposing the purchase of the strychnia on the Tuesday to have been also mis-stated, the proof that Cook died of strychnine-poisoning still rests securely on the evidence afforded by the symptoms, and by Palmer's conduct before and after the occurrence, including his previous administration of antimony and his appropriation of Cook's property. The history of the symptoms on both occasions is vouched-for by such a mass of witnesses, as to leave no possible doubt as to the main facts; and the minor discrepancies are such as all human testimony is liable to. So, again, the history of Palmer's pecuniary transactions is so complete and consistent, that no considerable flaw can be suspected to exist in it. We must take the whole as it stands, or reject the whole as the most extraordinary piece of imposture that ever was devised.

We have left ourselves but little space to dwell upon the other part of the subject which we proposed to ourselves to discuss—the peculiar moral phenomena which Palmer's history presents. This would seem at first unmistakeably to indicate a state in which all natural feelings had become callous, and the light of conscience entirely extinguished. It seems difficult to account for the hardihood with which (if there be any truth in the antecedents currently laid to his charge) he coolly sacrificed his wife, his wife's mother, his brother, several illegitimate children, at least one victim of his seduction, besides two or three other individuals,—without exhibiting in his face and manner such evidence of a brutal nature, as to cause all around him to shrink from him with abhorrence and disgust. On the contrary, all accounts attribute to him not only an entire absence of anything like ferocity, but an attractive *bonhomie* arising from a constitutional kindliness of disposition,—in fact, that sort of nature which impressed most persons who came into contact with him, with the notion of his being a pleasant sort of a fellow, who would rather do a kindness than an injury to any one. In this respect, Palmer's character seems to have been a striking contrast to that of Dove, the Leeds poisoner, whose nature seems to have been essentially brutal, leading him to delight in the infliction of suffering on others, and making him an object of repulsion to those about him. But to those who look beyond the surface, the apparent inconsistency will disappear. In the one case, as in the other, the unbridled indulgence of selfish propensities was the dominant feature in the character; and though the mode of indulgence was different, the result was the same. The "turf" seems very early to have had a peculiar fascination for Palmer, and to have exercised that baneful influence over him, which *any* fascination—whether for women or wine, gambling or horse-racing—will exert on those who allow their better nature to be overpowered and their will to be led captive by it. No tyranny is more complete, than the tyranny of one absorbing passion. However virtuous and amiable a man may be in every relation of life, yet if he once give himself over to any such influence, he gradually becomes so completely enthralled by it as to feel powerless for self-extrication; and thus he may be driven,

irresistibly at last, to the commission of any crime, however monstrous, without having forfeited by any overt act the general estimation in which he is held. Such a state of subjection to a dominant impulse is really, when complete, to be accounted monomaniacal; and we believe it to be, as we urged on a former occasion,* the state in which many great crimes are committed. But the criminal is justly punished, not so much for the act itself, which he scarcely had within his control, as for the antecedent course in which he had the power of checking himself. The case seems to us like that of a man in a boat that is being drawn towards a waterfall by a current, out of which a moderate exertion will enable him to project himself; not having made that exertion in time, he is carried-on faster towards destruction, but still may be saved by a vigorous effort; the time for this goes-by, and he is hurried along by the irresistible force of the torrent, until precipitated to his destruction in the depths beneath.

We will not inquire too narrowly into the nature of the early influences under which Palmer was brought-up; but enough has publicly transpired to make it obvious, that whilst they were of a kind to foster both self-indulgence and sensuality, they were but little favourable to the development of the moral sense. And if we are rightly informed, there were circumstances in his student-career, which showed that no firm barrier of principle had even then to be broken-down, when his absorbing passion required the means of its gratification. Had the black catalogue of his imputed crimes been then exhibited to him, or had it been predicted that he would commit that single one for which he has suffered, he would doubtless have repudiated the idea with abhorrence. But such a warning would probably have had little permanent effect upon him. No habitually-recurring temptations are capable of being resisted, save by a man of most determined will; they must be fled-from; and Palmer was not a man to do either the one or the other. The man who began with fraud proceeded to forgery; from forgery the descent was rapid to poisoning, for the sake of preventing its exposure; and when once familiarity with the idea had been established in his mind, he seems not to have been restrained by any lingering feeling of humanity, but to have given himself over to the pleasure of successful villany, not unmingled, perhaps, with some professional interest in the course of the fatal events which he had devised.

Such is one of the dreadful results of that habitual yielding to the indulgence of selfish propensities, which allows them to take full possession of the soul; and from such tyranny, yet more than from its consequences, should every one of us both pray and strive for deliverance.

It is not uninstructive to contrast with the character of Palmer, that of the wretched Dove, whose crime, identical in itself, but far different in its mental source, may be considered in some degree as a consequence of his own. It seems scarcely possible to conceive two men more unlike than these, save as to the predominance of evil in both. Palmer was a remarkably complete villain. His vigour and address in carrying-out his plans, were in perfect harmony with his sagacity in devising, and his determination in resolving upon them; whilst the coolness and suavity which he seems to have maintained even under the pressure of circum-

* British and Foreign Medico-Chirurgical Review, vol. xxiv. p. 240.

stances which would have rendered most men restless and irritable, served as an admirable veil to the fearful schemes which he was working-out beneath. Dove's order of villany, on the other hand, was a very low one,—that of the sneaking, irresolute coward, who has neither sense to form deep-laid plots, nor daring to execute them, but who does just as much mischief as he thinks he can without disagreeable consequences to himself. That his intellectual powers were of a very inferior order, cannot for a moment be doubted; that his tastes were naturally low and selfish, and that he was singularly deficient in consideration for the feelings of others, appears equally clear. Still there is no evidence of any deterioration of his reason, or of any perversion of his moral nature. What he was when he poisoned his wife, he seems to have always been. None of the witnesses who were brought to prove his insanity, could point to any recent change in his conduct or demeanour; on the other hand, their testimony, going back to his childhood and youth, showed him to have been from the first one of those ill-conditioned persons, who unite a semi-brutal *morale* to a weak intellect and feeble will, only wanting more hardihood of character to become absolutely ferocious. His passions do not appear to have been strong enough to master what reason he had; nor does it seem that habitual indulgence in any one special vice had given to it a tyrannous power. His case, on the contrary, seems to have been one of a kind not at all uncommon, in which the habit of yielding to any impulses and suggestions that fall-in with the selfish propensities of the individual, prevents the will from ever acquiring its rightful domination. The remarkable confession which he left behind him, seems to us (as regards its main features at least) to bear as strong an impress of truthfulness as any similar document we have ever perused; it shows how the suggestive influence of the wicked counsels of the "wise man" of Leeds, taking root and flourishing like rank weeds in a soil too poor to furnish a wholesome crop, concurred with the notion as to the non-detectibility of strychnia, which Dove derived from the early proceedings against Palmer, to give his thoughts the direction towards their final issue; but a more striking picture of irresolution was perhaps never drawn, than that which this poor wretch has left, of the succession of nerveless attempts whereby he familiarized himself with the use of the deadly weapon, which he used at last with fatal effect. Here, as in the case of Palmer, we have to look upon the crime itself, not as an isolated act, but as the almost natural result of a habit long previously formed; but while the habit consisted, in the one case, in the fostering care with which a master-passion was cherished, until it tyrannized over a will whose strength was shown (like Samson's) even in its captivity, in the other it was the early indulgence of every selfish and malevolent impulse, which prevented the will from ever attaining its rightful sovereignty. How solemn is the lesson afforded by each of these terrible cases, especially to all concerned in the training of the young, we trust we need not point out. Both speak, though in different ways, as to the essential importance of the culture and discipline of the Will, and of the early and firm implantation of those principles of Right by which alone it can be safely directed.

William B. Carpenter.

PART SECOND.

Bibliographical Record.

ART. I.—1. *Practical Remarks on some Points in the Physical Diagnosis of Phthisis Pulmonalis.* By JOHN HUGHES BENNETT, M.D., F.R.S.E., Professor of the Institutes of Medicine and of Clinical Medicine in the University of Edinburgh.—*Edinburgh*, 1856. pp. 37.

2. *Lectures on Clinical Medicine.* By JOHN HUGHES BENNETT, M.D., F.R.S.E, &c., Nos. 9 and 10.—*Edinburgh*, 1856. pp. 389 to 504.

BOTH these works contain matter of much interest. In the first, Professor Bennett directs his chief attention to the consideration of the value of the cracked-pot sound, which, like other physical signs, is losing its pathognomonic character, and demands a careful balancing of the concomitant conditions to assist us in determining its exact signification in individual instances. No one who has employed percussion extensively, has failed to see cases in which a marked *bruit de pot fêlé* was produced in the absence of other symptoms of a tubercular cavity. Dr. Bennett, for the purpose of rigidly testing the question, examined one hundred patients indiscriminately, and thus found that the cracked-pot sound (alas! that we must employ so grating a term) may be elicited in the perfectly healthy adult chest; and that, as Skoda has before pointed out, it may be produced in young children. The following are briefly the results of an analysis of the hundred cases:—The sound was absent in five cases exhibiting all the signs of cavities, and in two of these the presence of small cavities was proved by the cadaveric inspection; the sound was present in four cases of pleurisy, and several of pneumonia, in which there was no suspicion of a cavity; it was present in several cases where there was no evidence of any disease in the lungs at all; and it was observed to come and go in the same individual, "evidently in consequence of changed physical condition in the lungs during the progress of the case."

In all, twenty-nine of the hundred cases presented the cracked-pot sound. Of these, four were affected with pleurisy, five with pneumonia, one with pleuro-pneumonia, six with phthisis, five were other diseases with pulmonary complication, and in eight the pulmonary organs were healthy. The conditions regarded by Dr. Bennett as essential to the production of the cracked-pot sound are—1. A certain amount of confined or tense air in the tissue of the lung; 2. The sudden compression of this air by a solid body in its neighbourhood; 3. Communication of this air with the external atmosphere. It is manifest that these conditions may exist without the presence of a tuberculous cavity. The facts

brought forward by Dr. Bennett and other observers prove that the sound may be produced in health, as well as in diseases not presenting caverns in the lungs; and that therefore it is important in estimating its value in individual instances not to regard it as indicative of one morbid change, but to allow our diagnosis to be fixed by the whole complex of phenomena.

The other subjects discussed in this work are The Diagnostic Importance of Bronchitic Signs as preceding and marking Tubercular Disease of the Lungs, and The Diagnostic Value of a Microscopic Examination of the Sputum.

The 'Lectures on Clinical Medicine' are the last parts of a series commenced in 1850. They treat successively of Rheumatism and Gout, Functional Disease of the Stomach, Organic Diseases of the Stomach, Gangrene of the Lungs, and Dysentery, On the Diagnostic Value of the Absence of Chlorides from the Urine in Pneumonia, On Nephritis and Pyelitis terminating in Extensive Suppuration, On Bright's Disease, On Peritonitis; and the work concludes with an oration, On the Ethics of Medicine, delivered by the author as Promoter of the Medical Faculty in 1840.

The cases contained in the volume are of great interest, and, with the commentaries, are well deserving of the perusal of the earnest student.

Art. II.—*Observations on the Operative Measures necessary in the Treatment of Hare-Lip.* By Richard G. H. Butcher, Esq., Surgeon to Mercer's Hospital, &c. Illustrated with Coloured Plates and Wood Engravings.—*Dublin.*

The arrest of development, known as hare-lip, has of late years received very much attention from all surgical writers, no less than from all surgeons who cultivate practical surgery. The state of the deformity, the manner of holding the child for the operation, the operation itself, the after-treatment, and the results, are but some of the subjects discussed in Mr. Butcher's treatise. We shall advert to some of the passages that strike us as being most remarkable. We are happy to find an expression in favour of early operating:

"I have watched over many with great anxiety, and am fully convinced that the safest period to the child for operation is from the termination of the first week to the end of the third month. No doubt it may be undertaken earlier, and has been with success in many instances; but I prefer waiting a few days after birth, in order, as it were, to allow the functions of the body to be healthily in action. During dentition some caution is requisite; but even during this process periods free from irritation and fever will arise which may be taken advantage of for operation. As the child advances in life the deformity is greatly increased, and the operative measures, I believe, become far more formidable; besides, the parts within the mouth, when the palate is widely fissured, become so disproportionately formed, that intonation and voice become spoiled for ever after. By delay, the tongue, as I have already alluded to, may become too large to permit of operation with safety." (p. 31.)

Mr. Butcher prefers the scissors to the knife for paring the edges of the fissure, and argues in their favour that they never contuse, and that they give less pain. To this we must take exception. Perhaps as compared with the large, ill-shaped, and badly-pointed old-fashioned scalpel

of the shops, badly-pointed because the end is round and the point not in the centre, they may be preferred. But most certainly not to the short, small, narrow-bladed and well-pointed modern knife. It is a fallacy to suppose that there are scissors with scalpel edges; if made they could not be used, because the blades would notch each other. We learnt this years ago, when endeavouring to procure such an instrument.

It is a rule of conservative surgery not to remove any part that can be saved, and more especially if it can be made available. This is particularly applicable to operations about the face; and above all, to that for hare-lip, as there is so frequently a want of integument, especially when there is double fissure. Therefore we did not expect to meet with the following passage from the pen of so good a surgeon:

"In addition to what I have already written about the management of the central piece of the lip in the double form, I have only to add, that when it is large enough to come down on a line with the red margins of the lateral portions, and even covered with a red border, I do not save it to make a part of the lip below. I have seen it, when preserved, fail to accept the union on one or the other side; and I have also seen a double notch occasioned by its preservation." (p. 42.)

We have ourselves many times made the piece available, and obtained a result that could never have been got without it, but for this a knife was required. The parts would have been too much bound with scissors to unite.

A good deal of diversity of opinion prevails as to the best mode of dealing with the projected maxilla, and the detached central osseous piece, in cases of complicated hare-lip. Some of the very highest authorities recommend cutting off the projecting piece. Sir A. Cooper says, "when the jaw itself projects, the common preliminary step to the operation consists in cutting away the bony prominence." Chelius likewise inculcates this precept in the following passage:

"If there be a bony growth in the cleft, it must, after the skin covering it has been raised, be removed with the nippers."

And again:

"If the incisive teeth project, they must be extracted if of the first set; but if of the second, it must be attempted to give them their proper direction by continued pressure, and if this be not possible, they also must be extracted. . . . On no account, in my opinion, should the projecting maxilla be cut away. In the youngest infants I have bent it back, rupturing its elastic structure; and in more advanced life, after Gensoul's method, breaking it with a forceps, and thrusting it back; and after either experienced but little difficulty in steadying the piece in its new berth." (pp. 42, 43.)

A method of dealing with protruding alveolus was introduced by Mr. Haynes Walton so long ago as 1848, and as it has escaped Mr. Butcher's notice, we quote it, because we believe it to have been adopted by all who are acquainted with the proceeding. After describing the preliminary operation on the lips, Mr. Walton continues:

"I now cut through the protruding alveolus in its entire thickness, applying the fine forceps at the spot, about corresponding to the space between the first and second incisive teeth (and it has happened in all the cases that the deviation from the natural contour commenced just about there), and bend back to the desired level the partially detached portion. The soft parts can now be brought

together with as much facility as when only fissure of the lip exists. Not much force is thus required in dealing with the bone after the forceps have been applied. There is no fracture, but a yielding, which, I imagine, may be ascribed to the yet imperfectly ossified incisive and palatal portions of the maxilla." (Braithwaite's 'Retrospect.')

Mr. Butcher objects to the use of an anæsthetic. "Once for all, I repeat, the risk is too great for its adoption." This we should scarcely have expected after we are told that one out of the eight cases narrated "died from fright." We think that chloroform would have given a better result.

The coloured lithographs that adorn the letter-press are executed with great taste and neatness.

ART. III.—*The Microscope and its Revelations.* By WILLIAM B. CARPENTER, M.D., F.R.S., F.G.S., Examiner in Physiology and Comparative Anatomy in the University of London, Professor of Medical Jurisprudence in University College, President of the Microscopical Society of London. Illustrated with 345 Wood Engravings.—*London,* 1856. pp. 778.

IT is rather with a view to showing our readers that we have not overlooked Dr. Carpenter's work on the microscope, than for the purpose of discussing it, that we prefer at once to advert to it briefly, than to delay our notice until more leisure and space would enable us to do full justice to it. The author's object is to guide the possessor of a microscope to the "*intelligent* study of any department of natural history that his individual tastes may lead him to follow out, and his particular circumstances may give him facilities for pursuing." Hence the work necessarily excludes the consideration of pathological or industrial microscopy. These subjects would be too special to call for their admission into a book of the kind before us.

After an introductory history of the microscope and microscopic research, five chapters are devoted to the optical principles of the microscope, The Construction of the Microscope, Accessory Apparatus, Management of the Microscope, and The Preparation, Mounting, and Collection of Objects.

The remainder of the work is devoted to the microscopy of vegetable and animal tissues, and of the inorganic kingdom. These subjects are treated successively in fifteen chapters, under the following heads:—Protophytes, The Higher Cryptogamia, Phanerogamic Plants, Protozoa, Foraminifera, Polycystina, Sponges, Zoophytes, Echinodermata, Polyzoa and Compound Tunicata, Molluscous Animals generally, Annulosa, Crustacea, Insects and Arachnida, Vertebrated Animals, Applications of the Microscope to Geology, and Inorganic or Mineral Kingdom, and Polarization.

We have no doubt that the completeness of the information imparted, and the practical utility of the work, which is not a little enhanced by the admirable illustrations profusely scattered through it, will secure to it a reception in every way commensurate with the high reputation of the author.

ART. IV.—*On the Defects with Reference to the Plan of Construction and Ventilation of most of our Hospitals for the Reception of the Sick and Wounded.* By JOHN ROBERTON, Surgeon. (Reprinted from the 'Transactions' of the Manchester Statistical Society.)

ONE of the reasons why, generally speaking, an improvement takes place in the condition of the patients on admission to a public hospital, is to be found in the fact of their removal from a less pure to a better atmosphere. The necessity of proper ventilation in all abodes of the sick is now no longer a matter of speculation, though the best mode of securing that ventilation is still *sub judice.* It appears as if the multiplicity of inventions and ingenious contrivances were, after all, to conduct us to the unity of the fact that the ordinary window, with its vertical or horizontal movement, is the best, the simplest, and surest mode of securing pure air in our apartments and in those of a hospital. This, too, seems to be the view upon which Mr. Roberton urges the propriety of following the very excellent plan for the construction of hospitals adopted by the authorities of Bordeaux. Mr. Roberton, adverting to the prevailing arrangement of our own hospitals, shows that it tends to create a *hospital atmosphere,* owing to all the wards communicating with one another by passages and stairs. The peculiarities of the Bordeaux Hospital, to which the St. John's Hospital at Brussels, the new Lariboisière and the Beaujon Hospitals at Paris, are analogous, are described as follows:—

"Standing in an open space of ground, called the Place du Fort du Hâ, we look on a fine building, the frontage extending perhaps 140 yards. Passing in at the centre gateway, we behold a beautiful court, of about a quarter of an acre, planted with evergreens and flowering shrubs, surrounded by a carriage drive, and beyond the drive, by a light arcade or ambulatory which serves to connect on the two sides facing each other a succession of pavilions or tiers of buildings standing parallel, and having the ends towards the square. We step under the arcade, and above a door opening into the basement at the end of one of these pavilions we see the words 'Salle Seconde.' We enter, and discover a ward about 140 feet long, 30 feet wide, 19 or 20 feet high, having tall, narrow windows, directly facing each other on the opposite side walls, containing thirty-eight beds—nineteen on either side, and each bed—the bedstead small and of iron—hung round with white dimity curtains, but having no tester. Near the entrance is a room for the sisters or nurses, and at the extremity of the ward, a door on the right hand, leading to clean, well-ventilated closets, and a door on the left to a spacious lavatory.

"After surveying the general aspect of the ward, we feel tempted to look out at one of the windows, and are surprised to see a beautiful garden, planted with vines and roses—the garden surrounded by a neat footpath. We cross the ward, to discover what there is on the other side, and find a garden resembling the one we have just seen. The patients, whenever they chance to approach a window on either side, look into a beautiful garden.

"Having surveyed one ward, we ask the way to the next, and receive for reply, 'There is only one door; you go out at the door by which you entered.' Thus we discover the important fact, that as we entered this ward from the open air, so must we emerge from it again into the air. Once more under the arcade, we proceed towards the next pavilion, and find that, extending between the pavilion we have left and this one, is a light iron railing, through which we see one of the gardens already spoken of. There is a gate—we enter: the garden is in length the same as the ward, in breadth about fifty feet. On stepping into the ward next in course, we find it a copy of the former; and now we come to perceive that

as each pair of pavilions has a garden intervening, the windows of the wards look into gardens. Having examined the wards on the basement story of each of the separate pavilions—five in number—on this side of the square, we ask how we are to reach the wards in the second story, and are pointed to a stair at the end of the arcade, which winds up to a like open arcade above, out of which the wards are entered in the same manner as below. Every ward, I repeat, has one—only one door. You enter from the open air, and when you seek to return, your exit must be by the same door again into the open air. In follows, of course, that each ward is itself *a separate hospital,* having no communication with the other wards; so that if we were to suppose one of these to be crowded with the worst kind of surgical maladies for causing foulness, the foul air could not find a passage into any other ward—an hospital atmosphere would be impossible. I need hardly say, however, that the ventilation by windows being such as I have described, no ward need be allowed to become foul.

"Another advantage not to be overlooked attaches to this plan of construction; there is no need to limit the size of the hospital or the number of beds. In England, where nine-tenths of the hospitals are on the plan of an hotel or a large dwelling-house, we are afraid to open a large hospital. It has long been a painful conclusion of experience, that the larger the hospital, the higher the rate of mortality. Our Infirmary has little over 200 beds, rarely that number occupied, and yet, when the house is pretty full, the health of the patients, it is said, soon deteriorates; whereas, on the Continent, several of the finest hospitals accommodate from 600 to 800 patients. That in Bordeaux has 710 beds for the ordinary class of patients, and eighteen beds for paying patients. The number of patients of both classes in the wards, when I was there in 1855, was about 550. In an hospital such as this, if you were only to extend sufficiently the size of the court, and to multiply sufficiently the number of the pavilions containing the wards, thousands of sick might be lodged without inconvenience—without the slightest risk of generating an hospital atmosphere."

We regret that we are unable to add to this description the plan attached to Mr. Roberton's pamphlet. We thank him for drawing the attention of the public and of the medical profession to the advantages of this mode of construction, and hope to find an opportunity of entering more fully into the important questions involved in the selection of the site, arrangement, and general construction of hospitals. In the meantime, we advise a perusal of Mr. Roberton's paper by all who are likely to give an opinion on these matters. We would add a special recommendation for those of our readers, who may visit Paris, to inspect the new Hôpital Lariboisière, which has appeared to us one of the best constructed and most perfectly organized institutions of the kind we have ever examined. It is built upon the system advocated by Mr. Roberton, but having only been completed in 1853, is probably less known to our countrymen than the older hospitals of Paris. It is larger, and in most respects better appointed, than the Hôpital St. Jean at Brussels; though this too, on account of the excellency of its arrangements, and the peculiarity of its construction, merits to be examined by travellers who take an interest in institutions of the kind.

ART. V.—*Ismeer; or, Smyrna and its British Hospital in* 1855. By a Lady.—*London,* 1856. pp. 350.

MANY have doubted as to the success of the experiment of establishing civil hospitals at the seat of the late war; many have doubted the benefits

to be conferred upon the sick and wounded soldier by ladies who went out to tend them, following that yearning which impels all noble and energetic minds to succour the distressed. The simple and unaffected tale contained in 'Ismeer' can scarcely, we think, fail to convince the sceptic, that the ladies who accepted the mission executed it in the highest spirit of self-devotion, and without shrinking from the many painful and irksome duties which it necessarily entailed. There is a truthfulness and reality, with so complete an absence of all pretentious egotism, in the narrative, that the reader has a difficulty in laying the book down before he has perused the whole. The descriptions are so well coloured, and the anecdotes are so cleverly told, that we become well acquainted with the persons to whom we are introduced, and, for the time, inmates of the Smyrna Hospital itself; occasionally obtaining a glance at the verdure and richness of the surrounding country, a peep into the house of a Turk, or a glimpse of robber-life in the East.

The terms upon which the lady-nurses were with the staff and with the soldiers under their care is shown, by numerous anecdotes, poetic effusions, and letters of soldiers, scattered here and there through the book, to have been all that could be desired. After quoting a touching poem by an artilleryman, who suffered severely from chronic dysentery, which ends thus,

> "Might I march through life again,
> In spite of every bygone ill,
> To the end of life's campaign,
> I would be a soldier still;"

the authoress relates, that—

> "Another poor man of the same corps, who was crippled from chronic rheumatism, his hands being doubled up and perfectly dry and useless, two of the ladies used to rub them till a slight degree of moisture was perceptible. When he recovered the use of them slightly, he was ordered home, and he entreated to be allowed to remain, saying, 'that he should nowhere be so well attended to; and that his mother even, if he went home, could not do for him all the ladies were doing.' Another man wrote to his mother, saying, 'fine ladies and the best of doctors had come out from London to attend on him.'" (p. 130.)

The chief difficulties that the ladies had to deal with in the first instance, and, though not great in reality, probably the hardest to bear, was the prevailing error that, "as the ladies were undertaking an unusual work, they ought, as it were, to lay aside their position, habits, and feelings, and descend to the level of servants." Some little mortifying incidents took place at first, but, of necessity, the proper balance of society was soon established; and though serving, the ladies resumed their position in the eyes of the world. But the error did not so much affect the ladies as the nurses:

> "The real evil was done to the nurses, who fancied that according to our descent in the social scale was to be their ascent; and that by some process unknown, on their going out to the East they were to become ladies; and this for a time produced ill-will and bad feeling in some, but many of them were too sensible not to see things very soon in their proper light."

How the Smyrna Hospital was established, how Dr. Meyer governed the hospital, and the subordinate officers co-operated with him and the ladies—how they all worked—and how, too, they employed their time

when hospital work was slack, must be read in the book. We have only to add the wish, that the authoress, who must long to employ the tact and knowledge she has acquired at the Smyrna Hospital in a similar way in her native country, may find a suitable sphere for her talents—a sphere which it cannot be difficult to meet with, now that public attention is so largely directed towards "ameliorating the condition" of aimless ladies.

ART. VI.—1. *Manual of Chemical Physiology.* From the German of Professor C. G. LEHMANN, M.D. Translated, with Notes and Additions, by J. CHESTON MORRIS, M.D. With an *Introductory Essay on Vital Force,* by SAMUEL JACKSON, M.D., Professor of Institutes of Medicine in the University of Pennsylvania, &c. Illustrated with 40 Woodcuts.—*Philadelphia,* 1856. 8vo, pp. 331.

2. *A Handbook of Organic Chemistry; for the Use of Students.* By WILLIAM GREGORY, M.D., F.R.S.E., Professor of Chemistry in the University of Edinburgh. Fourth Edition.—*London,* 1856. Small 8vo, pp. 627.

We have, in a former article,* noticed Professor Lehmann's 'Handbuch der Physiologischen Chemie,' an abridgment, by the author himself, of his great work of Physiological Chemistry. Of this abridgment the greater part of the volume now before us is a translation. The reasons for the transposition of the title of the original are thus assigned in the preface:

"To adapt the work for the use of students of physiology, I have incorporated in the text additional matter (derived mainly from notes on Dr. Jackson's 'Lectures,' Carpenter's 'Human Physiology,' Todd and Bowman's 'Physiological Anatomy,' Kölliker's 'Microscopic Anatomy,' &c.) of a more purely physiological nature, which will be found included in brackets. Short notes have also been added, in the shape of an Appendix, on kindred subjects not treated of by the author; and illustrations selected from various sources have been introduced, instead of referring, as the author has done, to the 'Atlas of Physiological Chemistry,' by Otto Funke. These alterations have so changed the character of the work, as to render the title of 'Chemical Physiology' more applicable than that originally given to it of 'Handbook of Physiological Chemistry,' which has, however, been retained for Dr. Lehmann's portion of it."

The translation appears, on the whole, to be correct. Some passages are too literally rendered, and in some the meaning is obscure; but the work is, in the main, highly creditable to the editor. The publishers have done their part well; the type is clear and distinct, and the volume altogether is well "got up." Dissenting from the author's doctrine of Vital Force, the translator prefixes to the 'Handbook' an essay, prepared at his request by Dr. Jackson, On the Human Organism and its Forces.

In our tenth volume we noticed the third edition of Professor Gregory's excellent and comprehensive manual; the appearance of a fourth at a diminished interval is a sufficient indication that the original approval of the work has been more than ratified by the test of time. The rapid progress, during the last four years, of the science of which it treats, has rendered it necessary to make important changes throughout the volume, so as to increase its size by nearly one hundred pages. With

* Vol. xv. p. 102.

the aid of a short supplement, the work is made to embrace the most recent discoveries in organic chemistry; while, as in the former editions, a full index and a well-arranged table of contents render it a most convenient book of reference.

Art. VII.—*Physicians and Physic. Three Addresses.* 1. *On the Duties of Young Physicians.* 2. *On the Prospects of Young Physicians.* 3. *On the Modern Advancement of Physic.* By James Y. Simpson, M.D., F.R.S.E., Professor of Medicine and Midwifery in the University of Edinburgh, and Physician-Accoucheur to the Queen for Scotland, &c.—*Edinburgh*, 1856. pp. 133.

In the present restless and unsettled state of the profession, it is peculiarly gratifying to snatch a moment of repose for the purpose of reflecting on the picture drawn of our sacred calling by the masterly hand of Dr. Simpson. He speaks earnestly of the duties of the medical man, as every one must who is addressing an assemblage of young graduates; he warns them against entertaining undue and over-ambitious hopes of success, though he promises them an amount commensurate with their own labour and perseverance; Dr. Simpson holds up to the young physician the most gratifying assurance of satisfaction, pleasure, and happiness which the continued study of our profession and the conscientious fulfilment of its calls, carry with it. We think, with Dr. Simpson, that a glance at the past, a past which shows us that medical art has, in our country, during the last two hundred years, all but removed plague, ague, dysentery, scurvy, small-pox, and the dangers incident to child-birth—we think that the glance is calculated to fill us with cheering and bright hopes for the future; such encouragement is indeed necessary, for though much has been done, very much more requires to be effected, and will be effected.

Art. VIII.—*Letters to a Young Physician just entering upon Practice.* By James Jackson, M.D., LL.D., Professor Emeritus of the Theory and Practice of Physic in the University of Cambridge, U.S., Honorary Member of the Medico-Chirurgical Society of London. Fourth Edition.—*London* and *Boston*, 1856.

It is scarcely nine months since we had the satisfaction of speaking in terms of very warm commendation of Dr. Jackson's 'Letters' on their first appearance. That our opinion was just has been amply shown by the favourable manner in which the profession have received the book, of which we now introduce to our readers the fourth edition. We sincerely congratulate the venerable author on a result which cannot fail to afford him a peculiar gratification.

Art. IX.—*The Hospital System of London.*—*London*, 1856. pp. 53.

The pamphlet bearing the above title is one containing so much useful information, and so sensible a comparison between the French and Vien-

nese hospital system and our own, that we have no hesitation in drawing attention to it. It is simply intended to show, by reference to statistics, that our hospital system is one of great extravagance, that we are in the wrong in making the distinction that now exists between the hospital and the workhouse infirmary, and that the sick poor, as such, having an undoubted claim upon the community, their restoration to health ought not to depend upon the accident of their being acquainted with the governor of a hospital, but that they should all equally have the opportunity of enjoying the best accommodation and advice which the State can afford.

We much doubt indeed whether the French system of centralization is as beneficial as the author opines it to be, but we are satisfied that the manner in which money, time, and labour are frittered away and wasted in most of our hospitals, is injurious to the public at large, and far from advantageous to the profession. That our workhouse infirmaries deserve greater attention and regard, that the principles upon which they are conducted ought to be in every sense more liberal, is as certain as it is true that reforms in an opposite sense are desirable in the hospitals. The public now point to the hospitals as one of the things an Englishman may boast of: the public do not know that they are enacting the old story of St. Crispin, and filching from the medical man, directly and indirectly, what they, the public, ought to pay for fairly and honestly. But we abhor the cry, *ad misericordiam;* we are ourselves to blame for the self-inflicted losses—self-inflicted, because we submit to the vicious system of giving hard labour without the reward that every labourer may justly claim; what we would wish to impress upon the promoters of hospitals, is the necessity of reform in the management of institutions which, with an improved system, might be rendered at least twice as useful by affording aid to twice the number of sick poor, and by excluding those for whom the charities never were intended. We are unable to consider this question fully at present, but we would submit one calculation to our readers, which may induce them to reflect a little more deeply upon the point suggested:

"We find," says the author, "that in London 4,212 beds are maintained, and 37,886 patients treated, at an annual expense of 172,121*l.*; whereas in Paris, 6,854 beds and 87,007 patients only cost 162,732*l.* a-year."

From our acquaintance with hospital statistics, and from the authorities and official documents referred to in the pamphlet, we have reason to believe the author's statistical data to be correct. Our general opinion of the conclusions we have already expressed.

ART. X.—*Diseases of the Heart, their Pathology, Diagnosis, and Treatment.* By W. O. MARKHAM, M.D., Fellow of the Royal College of Physicians, Assistant-Physician to St. Mary's Hospital. — *London*, 1856. pp. 346.

DR. MARKHAM has here, without "pretending to offer the reader a full and didactic relation of all that may be said concerning diseases of the heart," brought together a great deal of information likely to be very useful

to the student and general practitioner. It is matter, however, which is to be found elsewhere. Dr. Markham has an admirable field for original observation at his disposal—he is an able physician; we should therefore have been better pleased to have met him as an original observer. Much has been done towards advancing cardiac pathology; this branch of medical science is by no means behind other departments of medicine. Still, much remains to be done. This has again forcibly suggested itself to us in the perusal of Dr. Markham's volume. The relations existing between cardiac and cerebral symptoms in acute rheumatism, the connexion between albuminuria and cardiac asthma, one of the most distressing and intractable affections to which the heart's functions are liable, are points upon which information is much wanted. The physical signs of diseases of the right side of the heart, again, are open to investigation; and we may point to the pathology and diagnosis of aneurism as well worthy of further inquiry. Nor can we think that fatty degeneration of the heart is a subject upon which some new light may not be thrown. These are some of the points to which we hope that future inquirers will direct their attention, which they can scarcely do without reaping a good harvest. It is in these fields that we wish and expect to meet Dr. Markham again, because, without wishing to detract from the utility of the present volume, we feel satisfied that his talents and abilities will there meet with a greater reward.

Art. XI.—*The Surgeon's Vade Mecum. A Manual of Modern Surgery.* By Robert Druitt, Licentiate of the Royal College of Physicians, London, Fellow of the Royal Medical and Chirurgical Society, of the Medical Society of London, &c. Seventh Edition. Re written, much Improved, and Illustrated by Three Hundred highly-finished Wood Engravings.—*London*, 1856. pp. 760.

It is unnecessary for us to say more of this—the seventh edition of a work deservedly popular—than that it contains a large amount of new matter, and that the most recent improvements in surgery receive full consideration and illustration. Dr. Druitt's 'Vade Mecum' in every way merits the confidence of the student and practitioner, and has our very warm commendation.

Art. XII.—*Traité Pratique des Propriétés Curatives des Eaux Thermales Sulfureuses d'Aix-la-Chapelle, et du Mode de leur Emploi.* Par L. Wetzlar, D.M., Médecin aux Eaux d'Aix-la-Chapelle, Membre de plusieurs Sociétés Savantes.—*Bonn*, 1856. pp. 82.

A Practical Treatise on the Curative Powers of the Sulphurous Thermal Springs of Aix-la-Chapelle, and on the Mode of Administering them. By L. Wetzlar, D.M., Physician to the Baths, &c.

We apprehend that the daily increasing facilities of travel will cause the annual migration of our countrymen to the baths lying in the volcanic regions of the Rhine and Bohemia to present a corresponding increase

after each session of Parliament. It behoves the medical man of this country to make himself acquainted with the characters and properties of those watering-places which are most in request among our countrymen, or, rather, offer the most probability of aiding the invalid in the recovery of his health. Among these, Aix-la-Chapelle occupies a prominent place. Situated on the great route to the antiquities of Cologne, and the yet more fascinating charms of the "wide and winding Rhine," it is one of the most accessible of the German watering-places, while the chemical and physical constitution of its water renders it of great value in a variety of chronic affections, which we frequently attack in vain by the ordinary forms of medication.

Dr. Wetzlar favours us with the results of a personal experience of twenty-three years. The contents of his book entirely accord with the title. The details of numerous interesting cases illustrate the doctrines which he promulgates, and give to the latter a more definite character than is always met with in the writings of balneologists. The diseases in which the sulphurous waters of Aix-la-Chapelle are chiefly beneficial are chronic rheumatism, old-standing syphilitic disease, and chronic affections of the skin. Other morbid conditions are benefited by the external and internal administration of these waters, but there is one disease which has repeatedly been brought under notice of late, and which appears to be more amenable to treatment by the Aix waters than by any of the ordinary pharmaceutical preparations—it is the fatty degeneration of the muscles characterizing what Cruveilhier has termed progressive muscular atrophy. Four cases are given in detail, in which the results are extremely favourable.

The use of the waters is inadmissible in fevers, acute inflammatory affections, active congestions, and in plethora; in tubercular disease, diseases of the heart, aneurism, hæmorrhage, cardialgia, recent diarrhœas; and in pregnancy.

To this brief summary of the indications and counter-indications for the therapeutic employment of the Aix waters, we would add our hearty commendation of the tone which pervades Dr. Wetzlar's book. Medical men anxious for information on the subject, will find it a useful and trustworthy guide.

ART. XIII.—*The Medical Remembrancer, or Book of Emergencies; concisely pointing out the immediate Treatment to be adopted in Cases of Poisoning, Drowning, Apoplexy, Burns, and other Accidents, with the Tests for the principal Poisons, and other useful information.* By EDWARD B. L. SHAW, late Surgeon to the Royal Humane Society. Fourth Edition, re-written and much enlarged, by JONATHAN HUTCHINSON, Surgeon to the Metropolitan Free Hospital.—*London,* 1856. pp. 107.

THE subject-matter of this little book is sufficiently indicated by the title, which we have given in full. The contents are arranged alphabetically, so as to be very easy for reference; and the whole constitutes, what it undertakes to be, a compendious and very portable *vade mecum* for the medical man. The information the booklet imparts is correct, suitably selected, and very properly condensed.

PART THIRD.

Original Communications.

ART. I.

The Blood—its Chemistry, Physiology, and Pathology. By THOMAS WILLIAMS, M.D., F.L.S., Physician to the Swansea Infirmary.

(*Continued from No. 29, p. 207.*)

IN the animal series, the fluids and the solids exhibit a never-varying relation to each other. Where the machinery of the latter is of low standard, the former is simple in chemical and vital composition.* As new organs are added to the organism in the zoological series, so new principles or elements are developed in the fluids, and conversely as the scale is descended. This proposition was discussed at length in former papers. Of course it is not given as an unexceptionable rule. Thus expressed, it may probably, as details of structures are more and more amassed by special and improved observation, come to wear too absolute a form. It was then stated that, in going down the series, the disappearance of an organ, or a system of organs, from the solids, implied necessarily the cessation in the fluids of those products which such an organ or system was designed to elaborate. But another method of descensive simplification was then also explained. It was shown that even the ultimate histological elements grew more and more simple. This idea was supported by the history of the muscle and nerve-tissue in the scale. It is self evident that the bile of an annelid or an echinoderm cannot be so complex a fluid as the bile of a mammal; because, first, the biliary organ in the former instances, by which that bile is secreted, is more simple than it is in the latter; and secondly, because the fluid from which that organ draws the product of its action is more simple. This argument applies with equal force to all the solid systems of the body. As the animal chain is histologically traced downwards, it is found that the higher class of tissues disappear more and more, and that the less endowed elements acquire a greater and greater predominance in the organism.

Of the *general* truth of these views, thus recapitulated after much subsequent study and observation, the author is still convinced.

The system of the fluids does not constitute, in the zoological series, an independent chain. A study of this system, apart from its con-

* See the author's preceding papers in this Review for October, 1853, January, 1854, January, 1855.

nexions, would lead to no useful results. Viewing it in its reciprocal relations with that of the solids, an intelligent observer cannot ascend or descend a step without acquiring a new idea or seizing a new principle. The fluids act and are acted upon; this is also true of the parenchyma. The reciprocity is an endless tangle. No one point more than another can be signalized as the beginning or the end of a succession. This difficulty renders the present inquiry both long and involved.

If it were required merely to trace the comparative chemistry of the animal fluids, the problem might be readily solved; but it is required that we also determine the varying anatomical relations of them in each class. The anatomical *place* of the nutritional liquid in the organism is an important event to record. From this fact may be inferred its nutritive value. Three distinct anatomical situations have already been indicated. In all the Polyp and Acaleph families it is contained within the digestive system; in the Radiate and Annulose classes it is lodged in the general cavity of the body, and constitutes a well-marked division; while in the Mollusca and Arthropoda it offers all the characters of a perfect circulatory apparatus. Such are the outline landmarks of this inquiry, as far as it relates to the invertebrate animals. It has already been prosecuted upwards to the limit of the Echinodermata.* In proceeding to that class which, on the ground of general affinities, may be placed next in the upward order, many anomalies will be discovered in the systems of the fluids. The *entozoa* present three prominently defined groups — the *Nematoidea*, the *Trematoda*, and the *Cestoidea*. The Nematode entozoa unite themselves most intimately with the Gordiaceæ, coming thus into immediate contact with the annelids.† The trematodes are organized on a plan almost identical with that on which the planariæ are constructed. There are, notwithstanding, several points of difference. In this direction, again, the entozoa are united by a continuous line to the annelids. The Cestoidea form a singularly isolated group. By their zoological affinities they are related only to the trematodes. In the character of their digestive system (if indeed there exist one at all) they are unique; in their fluid system, which has never yet been clearly defined or correctly understood, they stand in the animal series without a parallel. In the progress of the present papers it will be shown that, in the nature and properties of their parenchymatous tissue, the cestoids are also peculiarly distinguished. Destitute of a distinct digestive system, they are supposed to live by fluid imbibition at the general tegumentary surface. Destitute also of an individualized system of nutritive fluids, they may be said to be

* See this Review for January, 1854.

† In indicating this alliance between the Nematodes and the Gordius family of the Nemertine Annelids, I depend upon the accuracy of the details lately published by Meissner (see Zeitschrift für Wissenschaftliche Zoologie, Mai 20, 1855) with reference to the anatomy of the Gordiaceæ. This view, however, is not supported by Meissner himself. It is by Siebold. Meissner denies the nematoid affinities of *Gordius*, on the ground of a striking difference in the character of the digestive system. But if his account of the structure of the integuments and the reproductive organs in *Gordius* and *Mermis* be true, they must stand in very close proximity to the nematoids. It will be my duty, however, soon to show that the reproductive system of these two annelids, as represented by him, differ so widely from that of the Borlasiæ and Nemertidæ (so extraordinarily misunderstood by De Quatrefages), that it would be more consistent to place *Gordius* amongst the Nematoids than in the ill-appointed class of the Turbellaria. Meissner gives no account of the fluid system of Gordius.

reduced to the level of the protozoa. But this is to anticipate what will be afterwards given in detail.

The fluid systems of the entozoa cannot be satisfactorily studied without the previous discussion of some preliminary points. Is there any known animal whose bodily substance consists exclusively of solid or semi-solid parenchyma? Do the amœbiform animalcules fall under such a category? Are the gregarinæ and many of the infusoria to be thus defined? Let these points be passingly considered before entering at length on the subject of the entozoa.

A gregarina approaches, probably, more nearly to the structure and character of a "cell," than the other protozoa. It is, however, more like a cell in its mode of life than in its structure. It is curious that by the most recent observers, while the "vesicles" of all the protozoa are admitted *not* to be nuclei, but vacuoles, the vesicles of the Gregarinæ are recognised in that character.*

This view is not in accordance with the author's observations. If the vesiculæ in the gregarina be cell-nuclei, then the vesiculæ of all the protozoa can be none other. The same definition applies to a gregarina as to any other protozoon. But as Auerbach has lately shown, the nuclei are distinct from, and may coexist with, the vacuoles in the amœba. This animalcule is a mass of vital parenchyme. Its surface is a pellicle, not a cuticle. It is ciliated in some, smooth in other species.† The vesicule is single (fig. 1) in some species; in others, several are present; but only one nucleus, when seen at all, can be found in one individual. The pelli-

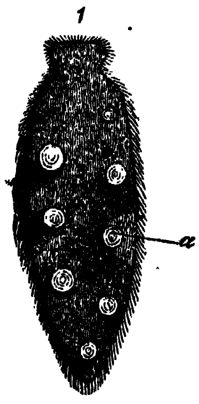


Fig. 1. Paramecium (?) from testes of Lumbricus terrestris. Mag. 500 diam.

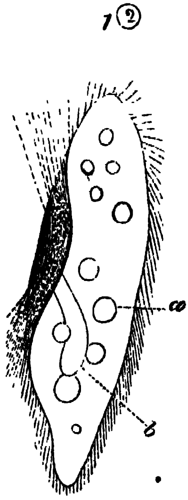


Fig. 1a. Paramecium caudatum, in outline.

a. Contractile vesicles.
b. Digestive cavity.

* Auerbach (Zeitschrift für W. L., &c., December 31, 1855), in a recent admirable paper thus expresses himself:—"Wie ganz anders verhalten sich in allen jenen Beziehungen die Gregarinen mit ihrer membranösen, ringsum geschlossenen Hülle, mit ihrem bläschenförmigen, kernkörperchen enthaltenden, einem Keimbläschen täuschend ähnlichen Kerne, mit ihrer Ernährung durch Aufsaugung der umgebenden Flüssigkeit."

† I cannot understand how it is that several writers whom I have consulted (Siebold, Stein, Cohn, Perty, &c.) should omit all reference to the *ciliated* surface of the gregarinæ. I can only account for this omission by supposing that there are two classes of gregarinæ, in one of which the pellicula is ciliated, in the other it is smooth or non-ciliated. It is most vigorously ciliated in the gregarinæ which at this season (August) abound in the liver of the cephalopods and the ovaria of *Lumbricus* and *Nais.—G. Scolopendræ*. (See p. 53 Ver. Anat. Physiol.) The surface is represented by Siebold as unciliated. Several varieties figured by Leydig in Müller's Arch., 1851, are also represented as unciliated. If they should be decided *not* to be Gregarinæ, then they must be admitted to be *agastric* paramecia. But whether they be Gregarinæ or Paramecia, the anatomy of them as described in the text will remain the same.

cula* is highly contractile. In virtue of the vermicular movement of this covering, the animal is observed to be constantly changing its form. In the elongated, band-like varieties, the extremities are curved upwards or downwards, and the body at some points of its length is compressed from the band into a thread-like form.

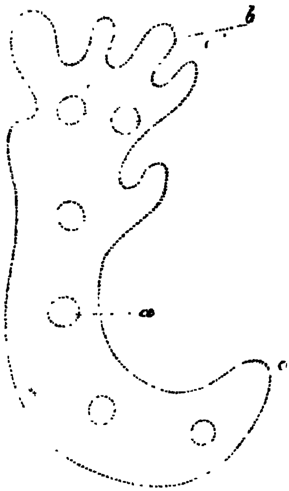


Fig. 2. Gregarina, from the liver of *Octopus vulgaris*. Mag. 500 diam.

a. One of the vesicles.
b. A contracted outline, taken while the object was in the act of changing its shape.

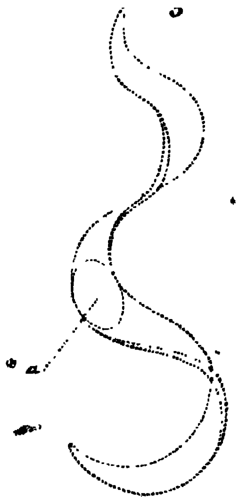


Fig. 3. Gregarina, from the ovaria of *Sabella alveolata*.

a. Vesicle.

If this transverse constriction be strong, the entire substance of the body is cut across. The author has repeatedly witnessed this fissiparous act It is effected by the powerful circular contraction of the pellicula. The characteristic of the cuticle of a gregarina is extreme irritability. With this property the ciliary coexists. The cilia are prolongations of the *pellicula*—a direct demonstration of the identity of the contractile or irritable and ciliary power!

What is the nature of the semi-fluid vital substance (*Körpermasse*) of which the entire body is composed? Is it a particle of granular protoplasm, in which there is no distinction of parts into fluids and solids? In such case a gregarina may indeed be defined as unicellular—the vesicles as nuclei. This view is certainly untenable. The vesicles are not nuclei. They contain no nucleoli. They are undoubtedly of the same character as the "contractile vesicles" of the infusoria. They do not, however, contract so visibly, but they do undergo a change of outline.

* In describing these animals, I adopt with great pleasure the terminology proposed by Mr. Carter in his recent admirable paper on the Infusoria, published in the Annals and Magazine of Nat. Hist. for Aug. 1st, 1856.

If they were nuclei, one only should exist in each individual. In the large gregarinæ of the cephalopods several, five or six, of various size, may be seen in every individual (fig. 2). Moreover, they are not always spherical.

In many instances they are elliptical (fig. 4). Sometimes the elongation of the vesicle is carried so far as to give it the form of an alimentary canal in the axis of the animal (fig. 5).

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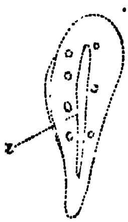

Fig. 4. Paramecium (?) Young. From *Nais Jordanii* (Mihi).

a. Elongated vesicle.

Fig. 5. Paramecium (?) Mag. 500 diam. From ovaria of *Nais Jordanii* (Mihi). The body is oval anteriorly, tapering to a point posteriorly—flat or band-like.

a. Is an elongated clean vesicle. It is surrounded by smaller ones, arranged in rows.

These large specimens are favourable for the determination of some points still *sub judice*, as to the real nature of these parts. In the instance of fig. 5,* the vesicle undoubtedly changes its size. At one moment it is seen as a line, at another it is much more obvious. It is not so easily proved, as in the infusoria, that the change of form is due to the contractile power of the vesicle. It may possibly result from that compressing, waving movement which is incessantly going on in the surrounding sarcode and pellicula. Other reasons, however, may be adduced against the theory which assigns the character of cell-nuclei to the vesicles in question.

Under certain circumstances, especially those of the partial drying of the animal, clear pellucid lines may be seen diverging in different directions from the vesicles, connecting the larger with the smaller, and appearing to traverse the mid-plane of the parenchyme. A gregarina, especially a ciliated species, may be likened to an oval cell with thick walls, flattened so as to bring the opposite sides into contact. The vesicles and sinuses would then occupy the line of contact. The existence of pellucid tubules radiating from the contractile vesicles has been observed recently by Mr. Carter, and before him by Spallanzani and Eckhard. Mr. Carter describes the entire system in *Paramecium aurelia*. In *Glaucoma scin-*

* I scarcely know whether I am justified in alluding to species not yet described. The annelid which I have called *Nais Jordanii*, is a minute, pure white worm, abundantly present in certain states of the weather in the fine sand of Zanglan Bay. It will, I trust, be both figured and described in my forthcoming Report on the British Annelids in the Trans. of the British Association.

tillans, not only the vesicles, but the radiating canals, have been seen also by Mr. Samuelson.* Mr. Carter also states† that the *vesicula* prolong themselves into canals in amœba, actinophrys, and other rhizopods. Satisfied as to the real existence of these vesicles and canals generally in the protozoa, this excellent observer commits himself to the belief that they constitute "a great excretory system;" and "should this system have any other uses, they are probably similar to the 'water-vascular system' of Rotifera."‡

It is more in accordance with analogy to suppose that it forms a nutritive system; that the fluid impelled by the contractile vesicles is nutritive; that, although at some points it may escape in a direct manner externally, it is not the less a nutrient liquid. In the infusoria there is no "cavity of the body." Even in the cœlenterata, the gastric canal is adherent externally to the solid parenchyme. Analogy, notwithstanding, strongly supports the idea that "the vesicles and sinuses" of the protozoa represent the perigastric chambers of animals higher in the scale. In the gregarinæ, agastric protozoa, and nearly all the infusoria, a system of contractile vesicles and appended "sinuses" (Carter) or tubuli have, then, according to the concurrent testimony of trustworthy observers, *a real existence.* Existing, what do they signify? Can they mean anything but that they are a nutritive fluid system? Is it possible that an excretory system can exist without a receptive and a circulating? If this apparatus of fluid contained in vesicles and canals constitutes a *necessary* and constant integer of these organisms, it undoubtedly implies a great complexity of structure. Such organisms are, therefore, not unicellular, but policellular. But compare a protozoon with an acknowledged *cell*—what a cell is, it is not easy to explain. It is an organic molecule, a vital unit, susceptible, within *certain limits*, of an independent existence. It consists of a centre, a circumference, and an intermediate protoplasm. Which is the *first*, productive, and necessary element, disputants have not determined. Whether the nucleus accretes the protoplasm and the involucrum, or whether the reverse is the real order of growth, observers cannot tell. But take a detached animal cell, one which floats in a fluid, such as fig. 6. A cellule, pregnant with contents, which arises by a spontaneous act in a protoplasmic fluid, what is its life-history? There are two modes of explanation—a cellule in a protoplasmic fluid may arise from the simple hardening or coagulation of the latter. At first a granule, a *solid* molecule, by imbibition, it may attain to the dimensions of a cell, bounded by an involucrum, and filled by liquid or semi-liquid contents; or, secondly, the cell-membrane may be formed first by the

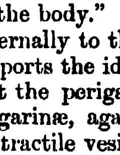

Fig. 6. A single corpuscle from the chylaqueous fluid of *Terebella nebulosa.* It is *filled* with pellucid vesicles and fatty globules. It is bounded by a thin, almost indeterminable pellicle.

* An excellent observer, who read a paper on the metamorphoses of this animalcule at the recent meeting of the British Association.

† Annals, &c., Aug., 1856.

‡ Much of what is very untrue, both anatomically and physiologically, has been palmed upon the credulity of naturalists in this country and in Germany, as to the so-called "water-vascular system" of the Rotifera. In my next paper in this journal, I hope to show that anatomists must change the name of this system and their views as to its uses. The fluid-system of the Infusoria is more like that of the Cestoid Entozoa than any other in the Invertebrate series.

simple hardening of fibrin, by the passage of the protoplasm from the fluid into the solid form. A cavity, a cell, would then be fashioned by the imbibition of fluid from without. In both methods the process would be almost mechanical. It is, *then*, by a *vital* act of the solid tissue thus formed that the cell is shaped into its final figure and size. The imbibing power of the cell-membrane may be easily rendered evident to the eye. The corpuscles of the chylaqueous fluid in *Nais intermedia** are large, granular, globular bodies. They consist of an aggregation of *solidified* protoplasm, and the cell is what it looks, a solid mass (fig. 8). If it be treated with very dilute acetic acid, it assumes the form presented in fig. 7. By a similar treatment the flattened form of fig. 6 may be changed into the globular.

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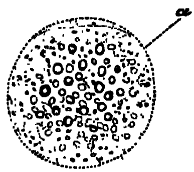

Fig. 7. Corpuscle of chylaqueous fluid of *Nais intermedia*, distended by very dilute acetic acid.

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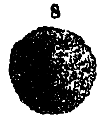

Fig. 8. Corpuscle of the chylaqueous fluid of *Nais intermedia*, much enlarged.

The exosmotic property of these cells is not so readily proved. One of the earliest signs of disease in *Terebella nebulosa* is discoverable in the condition of the cells of the chylaqueous fluid. In the state of full health these bodies are filled with a fatty semi-fluid material of high refracting power. In disease or decay these peculiar secreted contents pass out, and are replaced by the surrounding fluid admitted into the interior of the cell in the unchanged condition. In other words, the cell-wall loses its vital elective power. It is probable, then, that every cell in the living organism is the scene of a never-ceasing double current—the one going in, the other going out of the interior. Osmotic laws, now well established, render such a process readily comprehensible. The mechanism of the nutritive act, therefore, is, in a general sense, the same in the so-called unicellular protozoa as in a simple cell. In the gregarinæ the food is taken in indiscriminately at every point of the surface of the body by imbibition. The food consequently must be in the fluid state. On this point all observers agree. In spongilla, also, this is probably the case. But it is generally agreed that in amœba, actinophrys, the rhizopods, and agastric infusoria, only solid alimentary particles are taken as food. Suppose a particle of solid food, animal or vegetable, to find its way into the substance of the sarcode. It is closely embraced by the solid parenchyma. It is now liquified. By what? This little globule of fluid is then *imbibed* by the surrounding sarcode—or, by the same process of imbibition, it is first drawn into the vesicles and canals, and by them, aided by pressure, distributed throughout the body. This does not really differ from the surface-absorption as it occurs in the gregarinæ. It is impossible to conceive that the solid particle is *digested* in the substance of the amœba, for this implies a previously secreted special solvent. The nutritive fluid by which the food-particle is resolved is more probably *sucked* in and imbibed by the surrounding parenchyma. It is only *that* process which, in the gregarina, is performed by the surface. If this surface-fluid-absorption

* An undescribed species, very abundant in the fresh-water pools of the neighbourhood of Swansea—distinguished by the disproportionate size of the cells of its cavitary fluid.

does not occur in the case of amœba and actinophrys, it is because in them the *pellicula* differs in its chemical properties from that of the gregarina. This is a strong ground for believing that the cuticle differs structurally as it differs in its properties from the sarcode substance underneath—that it is not the latter simply solidified. These facts clearly prove that there are few points in common between a simple cell and a so-called unicellular protozoon. The simplest animal is far more complex than is implied in the word "unicellular." The faculty of locomotion, even by ciliary agency, is unknown amongst "cells." Cilia occur only on fixed, sedentary cells; never on the floating variety. They are designed to impart motion to an external body, not to carry the cell itself from place to place. The system of contractile vesicles and dependent sinuses, so general in the least organized protozoon, is unknown in the history of cells. They are not comparable even to the circulatory system of the vegetable cell. The "sarcode"—a most indefinite term—is without example amongst "cells," unless the semi-fluid substance which has lately been described by Dr. Walter, of Bonn, as contained in the muscle-cells of the entozoa, be so defined. Its composition may be inferred from that of the food upon which the protozoon subsists. If *many* cells have been engaged in producing the adult amœba, it cannot be said to be a mono-cell.

Fluid-absorption by the surface is the normal method of feeding, then, in these low types of animal life. This absorptive faculty is an inherent property of the substance of which they are composed. It attracts certain aliments as gelatine attracts water. Tissue, distinguished by the same character, prevails throughout the entire class of the entozoa. It is important to remember this fact. Why it should be called "sarcode" more than any form of flesh, is difficult to understand. It forms a chief constituent of the bodily parenchyma in those animals in which the *surface* fulfils an important part in the mechanism of alimentary absorption. In the cestoid entozoa it will be afterwards found to constitute a predominant structure.

It will be rendered probable in the course of this inquiry, that, although imperfectly-defined channels for the reception and distribution of fluid do really exist in the trematode and cestoid worms, as in the protozoa, such channels play a very subordinate part in the general machinery of the nutritive acts.

The reader is now prepared to enter upon the study of the fluid-systems of the *entozoa*. The *nematode* worms are not only zoologically, but histologically distinguished, and that strikingly, from all other entozoa. They differ in the chemical properties of the chief solids; they differ still more remarkably in the characters of the fluid-system. In all cases the body is cylindrical in figure. It is traversed from one end to the other by an alimentary tube. From that of the trematoda, this tube is distinguished by the existence of a posterior orifice. The nematodes are furnished with a general cavity, which is almost entirely filled with a vesicular tissue, in which a chylaqueous fluid is lodged. A vaso-fluid-system does not here exist—*organa genitalia segregata*. These are the leading distinctive features of the nematodes. Each deserves a separate study. Let us begin with the *integuments*.

The design of this course of study is not only to investigate the history of the fluids, but to explore the structure of those solid organs which may explain the anatomical position of the fluids in the organism, or illustrate their chemical composition. The integumentary covering of the nematoids, in this sense, will be found to play an important part. Vibratile cilia do not exist in this class. Neither within, on the viscera, nor on the cutaneous exterior, have they been detected in a single instance. The entire surface is smooth (the spines of some species excepted). There are no express provisions for breathing. In no known class of animals is this office of so low a standard. *The fluids of the body are not in motion as they are in the annelids.* A *fixed* fluid system is an anomaly in the animal kingdom. Why this is the case in the nematoda will be afterwards explained.

The first fact to be noticed in examining the tegumentary system of the nematoid worms, is the complete absence of those peculiar follicles (fig. 16) which constitute so marked a character of the cutaneous surface of the planariæ and the nemertidæ, and less distinguishably of the trematoda.*

No *fluid-bearing* process of any kind can be seen to rise above the plane of the epidermis. This fact is by no means devoid of interest: it proves how little these worms, in a respiratory sense, are under the influence of the medium in which they live; it proves that they do not respire by the surface; it proves specially, that no gas *in the aëriform state* can penetrate through the integument into the visceral cavity. There is no cutaneous plexus of vessels. If, therefore, there be in these entozoa a distinct respiratory function, it can by possibility consist only in this—that oxygen *in solution* is carried into the system of the worm by the surface-absorbed fluid. With this supposition, the entire physiological history of these animals is conformable;—sluggish muscularity, low motive and sensitive powers, a fixed fluid system!

The integuments in this family of entozoa have been described by all writers in nearly the same language. It is "thick and cartilaginous" (Nelson); "chitinous" (Walter); "dense from fibrous corium and structureless epidermis" (Meissner). Siebold† says, "The body of the helminthes is generally surrounded by a firm skin, which may be separated into a thin epidermis and partly hard *dermis*."

Meissner, in his account of *Gordius* and *Mermis*, describes the epidermis as *structureless*. Walter applies the same word to that of *Oxyuris ornata*. If by this word it is to be understood that the epidermis in the nematodes forms one continued *amorphous* sheet over the entire body, the author can only state that is a word which will lead the student to the most egregiously false knowledge. In the genera *Ascaris*, *Strongylus*, *Oxyuris*, and *Trichosoma*, which are so common and familiar, this question can most easily be put to the test of observation. The following account of the integuments has been more especially drawn from the study of the

* It has surprised me to find that Meissner (Zeitschrift für Wissenschaftliche Zoologie, 20 Mai, 1855), in his paper on *Gordius* and *Mermis*, does not allude at all to this point of structure. In *Gordius aquaticus*, which is by no means uncommon in this neighbourhood, the cutaneous follicles are very obvious.

† Anat. of Inv., by Siebold and Stannius, trans. by Burnet, p. 103.

following species—viz., *Ascaris lumbricoides*, *A. megalocephala*, *A. capsularia*, *A. truncalata*, *A. mystax*. But the author believes that it will apply, with slight modifications, to the entire nematoid family.

The epidermis is not a homogeneous sheet, but a highly-organized covering. It consists of two distinct planes of dense cartilaginous scales (fig. 9, *a*, *c*); each scale is a long parallelogram: it is four or five times as long as it is broad. The adjoining scales are united together by minutely granular lines, in the course of which, at regular intervals, are observable a stellar arrangement of granules or threads (*b*). Underneath this superficial layer lies a second, the scales of which course at an oblique angle with reference to those above them. The two sheets thus formed are cemented together at the granular lines and points (*b*). These two strata form a dense, but at the same time very transparent, envelope. Though dense and cartilaginous, each individual scale is perfectly structureless and diaphanous. A large piece of this epidermis may be most readily detached. It is not possible to discover, throughout the extent, of such a piece, any *perforations* whatever. But the entire epidermis is firmly attached to the underlying corium by means of a dense mass of minute threads. It follows that, if any fluid passes from the exterior into the cavity of the body, it must traverse this layer in one of two methods—either by endosmosis through the diaphanous substance of the epidermal scales, or through the lines and points by which they are at once separated and united. That the surface is capable of absorbing fluid in these worms, is beyond disbelief. It is possible that follicular perforations may have eluded the search which has been made for them; but the fact of the faculty of absorption cannot be disputed.

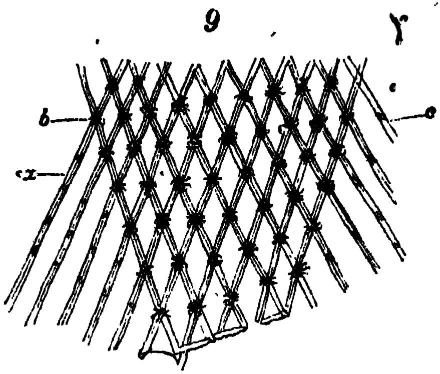

Fig. 9. Epidermis of Ascaris.
c. Uppermost layer of parallelogram scales.
a. The undermost layer.
a. b. The connecting lines and dots.

The next layer is called the *corium* or *dermis*. It is described by all authors as consisting of a fibrous structure. Walter, the most recent observer, defines it as chitinous-layer: "Das Corium besteht aus einer glashellen, homogenen, dicht mit der Epidermis verbundenen Substanz." It seems as if he saw no distinction between the dermis and Epidermis. There is a very marked one. As this structure constitutes a part of, and is in intimate connexion with, the *vesicular* tissue, immediately to be described, before proceeding further let us dispose of the muscular element of the tegumentary system. It is commonly said to form a dense web of fascicles, running in various directions; but blended into a solid layer. The error of this account may be readily proved. The muscular layer consists of two planes; the outermost is made up of large visible bundles

or fascicles. These latter embrace circularly, and with great regularity, the body of the worm. Each fascicle is constituted of a great number of secondary tubules.

The circular disposition of the primary bundles it is which gives an *annular* wrinkled character to the integuments of the large-sized nematodes. But a clear distinction should be drawn between this annular appearance and those deep-laid segmental formations which characterize this system in the annelids. Underneath the circular layer of muscular stratum lies one whose fascicles observe a longitudinal direction; but this layer is very much less developed than the circular.

The ultimate fibre presents all the characters of a tube or cylinder. The walls are streaked with minute longitudinal threads, between and amid which granules are interspersed (fig. 10, *a*, *b*).

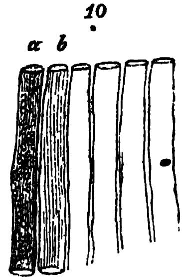

Fig. 10. Ultimate muscular fibres of *Ascaris megalocephala.*

To the right of *b* their tubular character is shown.

At *b* is represented the minute threads or fibres of which the walls of each tubule is composed.

At *a* is seen a tubule in its perfect state, filled with a granular fluid.

The interior of each cylinder is apparently filled with a homogeneous semi-fluid sarcode substance.

Walter states that he has observed the sarcode flowing out of these tubes in *Oxyuris Ornata!* If this be a fluid, of course it cannot be the seat of the contractile power of the muscle. This must reside in the fibrous wall of the tubule.*

No transverse striations occur in the muscles of the entozoa. The whole type of the organized solids is below such a possibility.

In connexion with the tegumentary system, should be spoken of those peculiar reddish lines most evident in the genus ascaris, especially in the lumbricoid species, which run along the sides of the body from the head to the tail. These lines are shown in section in fig. 11, *a a.* (p. 470.)

By all anatomists they are described as *vessels.*

Ascaris lumbricoides of the sheep or lamb is most suitable for an inquiry into their structure. By a little manipulation they may be detached as threads in long pieces. Thus placed under the microscope, it may be supposed that their real nature may be determined with facility. The point, however, is very difficult. The chief bulk is made up of solid muscular and nervous fibres. In the centre courses a hollow, fluid-bearing channel. It is very small, compared with the thickness of the entire band. This hollow channel is undoubtedly filled with the cavitary fluid. This fact is proved by throwing a thin coloured injection along the line of the intestine. It fills this channel. In fig. 12 is represented a longitudinal section of this red line, slightly compressed, under the microscope. It is composed of four elements. The first are the pigmented granules, to the presence of which is due the colour of

* Professor Ellis, in a paper lately laid before the Royal Society, thus describes the difference between voluntary and involuntary muscles:—"In neither voluntary nor involuntary muscles is the fibre of the nature of a cell, but in both is composed of minute threads or fibrils. Its surface-appearance in both kinds of muscle allows of the supposition that in both it is constructed in a similar way—namely, of small particles or 'sarcous elements,' and that a difference in the arrangement of these elements gives a dotted appearance to the involuntary, and a *transverse striation* to the voluntary fibres."—'Proceedings,' No. 22.

these so-called vessels. These granules are chiefly situated on the exterior, but they are also distributed between the fibres. Next is observed

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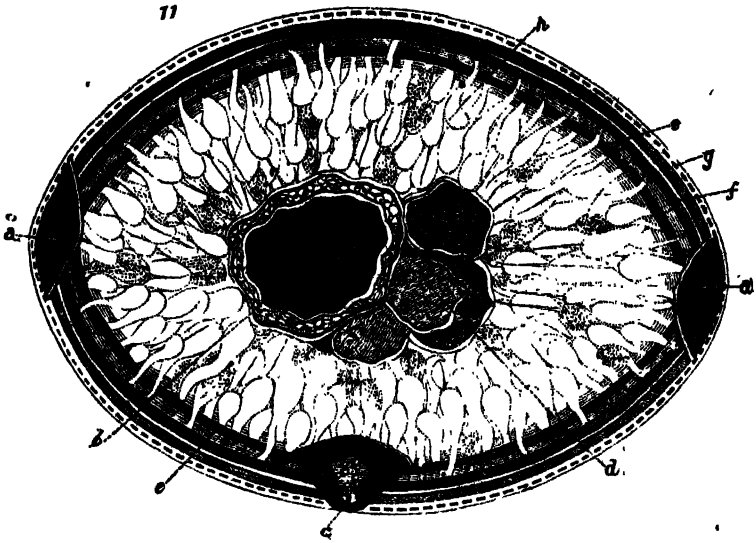

Fig. 11. Transverse section of *Ascaris lumbricoides* of the sheep.

a. a. Lateral red bands in section. *b.* Intestine.
c. Abdominal nervous chord. *d.* Reproductive organs in section.
e. e. Innermost longitudinal layer of tegumentary muscles.
f. Second layer, or circular muscles. *g.* Corium.
h. Vesicular tissue.

the fascicles of the muscular element, the structure of which is the same as that of the circular bands already described. But amongst the latter is seen a thread, distinguished from them in structure. It is a small nervous cord, the course of which is traceable by the fatty, high-refracting substance by which it is filled. This optical character belongs to the nerves of all the tissues in the entozoa. In the echinodermata, nearly all nervous threads are accompanied by a more or less distinct deposit of *red* pigment granules. In the absence of *red* blood, it seems to answer the purpose of hæmatosine in attracting oxygen. This is but a supposition. If there be in it any truth, it would equally apply to the corresponding coloured lines in the entozoa, for it should be stated that the abdominal nervous cord in ascaris is also surrounded by red-coloured granules.

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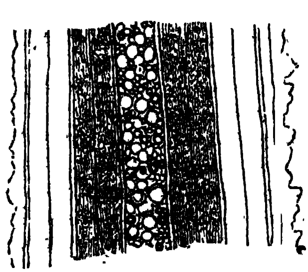


Fig. 12. Longitudinal section of red lateral lines of *Ascaris lumbricoides*.

The central fatty band indicates the nervous cord; those on either side, the muscular fascicles.

It is thus shown that the lateral reddish lines, in *Ascaris lumbri-*

coides are not vessels. If they be not vessels, *there is no other vascular system in any species of nematoid worms.* This statement does not rest exclusively upon the facts just stated. It is corroborated by an extensive search among several of the nematoid genera. The author, after numerous and difficult examinations, has concluded, that in the nematoid entozoa neither a water-vascular nor a "blood-vascular" system exists. This conclusion, although negative in its bearing, is of service to science. It determines the zoological standard of this family of animals. It sheds a ray of light upon the ill-understood fluid-system of an interesting class. In presence of a degraded apparatus of organized solids, a complex hydraulic machinery is not found in nature. If in these worms there obtained a vaso-fluid system, then every system of solids in the organism would be raised in standard, and the entozoon would become an anomaly in the animal scale. But these reflections are premature. It should be stated in this place that a structure having apparently the same character as that of the longitudinal lateral bands in *Ascaris*, has been described by Meissner in *Gordius* and *Mermis* as a "Secretions-organ."*

In interpreting these parts, Meissner seems to be guided by the views of Siebold and Van Beneden with reference to the "water-vascular system" and the so-called "caudal vesicles" of the trematode, cystic, and cestoid entozoa. The author will adduce strong evidence in his next communication to this Journal, to show that this analogy is without any foundation in truth. If, as supposed by Meissner, they are excretory organs, there is no *such* excretory organs in any other annelid. In the nematoids, the lateral bands are not an organ of excretion. This point is beyond doubt. In this place, therefore, it is not necessary to say more on this subject. But let it be remembered that the vessel-like channel which is embedded in the lateral longitudinal bands of *Ascaris* communicates freely with the general cavity of the body, and that the fluid by which it is filled is identical with the cavitary fluid.

If these, so-called by the German anatomists "secretions-organe," were organs of secretion or excretion, they should be present under some form or other in all the genera of this order. The truth is, that the lateral bands are detectible only in the genus *Ascaris*. In the smaller nematoids, no trace of them can be discovered. In an account of the anatomy of these worms, Lieberkühn says,—"Die sogenannten Seiten-, Bauch-, und Rücken-linien habe ich nicht mit Sicherheit auffinden können."†

Leidey‡ does not allude to them in his description of Ascaris infecta. The fact is, that in the present imperfect state of knowledge with reference to the *nature* and mechanism of secretion in the lower invertebrata, secretory and excretory offices are assigned to parts and organs which have nothing whatever to do with such functions.

* In *M. albicans* and *M. nigrescens*, Meissner figures three "secretionsorgane," of which one rests on the abdominal nervous cord, the other two being situated one on either side. In *Gordius* there is only one—the abdominal. He gives an extraordinary account of these "secretions-organe." They are tubular ducts, which begin in open orifices near the mouth, and end in open outlets near the tail. These tubes are filled with cells. The cells are excretory products! Chauvet, quoted by Meissner, believed this canal to be connected with the reproductive system. Bertholt and Siebold, again, express different opinions. Vide Zeitschrift für Wissenschaftliche Zoolog., 20 Mai, 1855.

† Müller's Archiv, 1855.

‡ Flora and Fauna of Living Animals, 1853.

At a future stage, this question will be further discussed.

Let us now revert to fig. 11, in order to consider another important element of the integumentary system of the Nematoidea—namely, *the vesicular tissue and the corium*, (*g*, *h*, fig. 11.)

The author would define the "vesicular tissue" as consisting of a mass of pyriform vesicles depending into the cavity of the body from the internal surface of the integuments, each vesicle having its base directed towards the intestine, and its neck towards the cutaneous surface.

In some genera, so considerably developed is this tissue, that it literally fills the splanchnic interval which divides the intestine from the integument; in others, on the contrary, it is much less evident. Under the latter circumstances, a clearly-marked perigastric cavity exists. This tissue does not appear to be unknown to anatomists. By different observers it has been variously interpreted.

Charvet thinks that it forms the glandular origin of two canals which are said to unite in the caudal vesicle. Berthold associates it with the generative system; Dujardin assigns to it a muscular nature; Siebold partakes in the opinion of Charvet, and compares it to the "Pflanzenparenchym." Meissner also speaks of "der grossen Aehnlichkeit der Zellen des Zellkörpers mit Pflanzenzellgewebe." Meissner's description relates to this cellular body only as it occurs in *Gordius* and *Mermis*. He figures it as lined by a distinct membrane, and consisting of cells, polyhedral from pressure, *in each of which is contained a well-marked nucleus*. He then proceeds to show, by the use of various reagents, its chitinous composition. He seems to be of the opinion of Siebold, that it constitutes an organ of secretion, and further suggests that it may have something to do with the formation of cellulose.*

The following description has reference only to this tissue as it occurs in the nematoid entozoa. It has been stated already, that the corium (fig. 11, *g*.) consists of a cellular layer, which lies immediately underneath the thick, leathery, yet transparent epidermis. It is connected above with the epidermis, but its most important relation is with the vesicular tissue beneath. An inspection of fig. 11. will render this evident. It is seen that the *necks* of a large number of the pyriform vesicles (*h*) pass through the layer of muscles (*e* and *f*) outwards, as far as the corium or dermis, in which they are lost. The structure of the dermis is precisely the same as that of vesicular tissue. It forms but a thin layer. The leathery, dense character of the integument is due, not to the corium, but to the epidermis. The great mass of the vesicular tissue is adherent, and forms a flocculent, spongy lining to the internal surface of the integument. Every vesicle does not pass out into the tissue of the dermis. The great majority run together to form an areolar layer on the internal surface of the muscular stratum. The areolæ of this layer

* At a future time, when in the course of these papers it becomes my duty to treat of the fluid system of Nemertine Annelids, it will be rendered very probable that Meissner has mistaken the ovarian system for the "Zell-körper," and that which he calls the reproductive organs, is a part of the alimentary system. De Quatrefages' account of the organization of the Nemertidæ, and Meissner's of the Gordiaceæ, *cannot both be true*. I am at present strongly of opinion *that both are wrong*. De Quatrefages makes no allusion to anything approaching to this cellular body as figured by Meissner in *Gordius* and *Mermis*, in his account of the anatomy of the Nemertine Annelids.

are not so uniformly and regularly Florence-flask-shaped as those of the tissue which depends from it into the cavity of the body. The vesicles of the latter are single and independent. *They are pyriform bags, filled with a fluid.* This fact can be proved incontestably in various ways. The first proof is the optical. To a microscopically-trained eye such an inference would be at once accepted. They are capable of being filled with fluid, either by immersing a fresh, but slightly-dried specimen in a thin coloured fluid, or by injecting such a fluid indiscriminately into the cavity of the body. The broad end or base of each vesicle is turned towards the intestine or central axis of the body. From the base of each vesicle there extends a thread-like process of areolar tissue, which ties it to the viscus. In the genus *Ascaris* this tissue is thus much more extensively and intimately connected with the intestine than with the generative organs, which, like the former, are cylindrical tubules occupying the axis of the body.

This arrangement may be supposed to prove that the fluid contents of the vesicular tissue is derived directly, by absorption, from the intestine. Such a conclusion is not necessarily true. These vesicles are capable of being filled by the absorption of fluid through the cutaneous surface. During life, the nematoid entozoa are endowed with the power of controlling this absorptive power—of increasing or of decreasing it at will.* A directly contrary statement, however, is made by Siebold. He remarks that these worms, *when put into water*, die by bursting. This only proves that they are rapidly killed by the medium in which they are immersed. It does not prove that in their natural element—the animal fluids—they are incapable of controlling this absorptive faculty. What, then, is the physiological office, and what is the homological history of this tissue? It exists in all the nematoidea; but it is less developed in the viviparous than in the oviparous orders. In the former,† the cavity of the body is almost as distinctly marked as it is in the annelids; in many species of the latter, the perigastric space is almost entirely filled by the vesicular tissue. In no case, however, is this cavity completely obliterated. It exists, and is charged with a considerable bulk of fluid, even in *Ascaris lumbricoides*, in which this tissue is most exuberant. This fact may be placed beyond doubt by snipping through the integuments near the tail, and then holding the worm with the head uppermost for some time over a cup. A large quantity of fluid will rapidly flow out. It is quite certain that if there were no free open space between the intestine and integument, the fluid could not thus readily escape; for if it were lodged entirely in the cells of the pyriform tissue, it could but slowly flow out.

* Siebold says, "This absorbent power is particularly prominent in the Acanthocephali. It is here really a vital act." The discovery of the vesicular tissue which I have described, and with which Siebold does not seem to be acquainted in the least, *explains this absorptive power*. This distinguished observer further states, that the *Echynorhynchi*, which naturally absorb only a little liquid into their flattened and wrinkled body, will swell and relax alternately when in contact with water.

† To this fact my attention was first drawn by Professor Busk at the Cheltenham meeting of the British Association. Since then I have carefully repeated many of my former dissections. In *Strongylus auricularis*, *Ascaris acuminata*, and *Ascaris trigonura*, which are viviparous, I find that the vesicular tissue encroaches upon the general cavity less than in the oviparous species. In examining the above species of viviparous entozoa, I could not convince myself that the young were contained *in the general cavity of the body*. Professor Busk, however, stated that in the guinea-worm that was really the fact.

Even by transverse sections, it is, however, possible to show, in several species, that a distinct unoccupied interval exists on one side of the intestine (the tissue being closely attached to the other), in which the cavitary fluid has a free longitudinal channel. In the small ascarides which are found in so great abundance in the intestines of fishes, by a transparent view it is very easy to bring directly under the eye both the disposition of the vesicular tissue and the splanchnic space which intervenes between the intestine and integument.

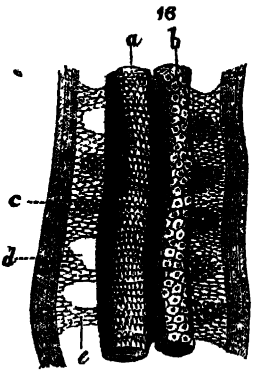


Fig. 16. A transparent view of a portion of the mid-body, a small transparent nematoid worm from the peritoneum of cod.
a. Intestine.
b. Ovary.
c. Same, filled with fat.
d. Spaces, constituting the general cavity of the body.
e. Vesicular tissue.

In many instances (as in fig. 16) the tissue assumes the form of bridle-like processes, extending from the integument to the intestine, and tying the latter so firmly down as to render the longitudinal to-and-fro-motion of the intestine, so characteristic of the alimentary system of the annelids, quite impossible. Regular deposits of fat are observed in many cases (fig. 16, *c*), which may be compared to the segmental developments of the annelids. It is, then, to be understood that *in no species* does the vesicular tissue obliterate the peri-visceral space. It is present in all cases, though more markedly in some instances than in others. In all cases it is occupied by *a fluid, which is the only nutritive fluid in the organism of the nematoid entozoon.* Before proceeding to consider the history of this fluid, let us revert once more to the vesicular tissue. Is it the office of this tissue to draw fluid into the body by vital or mechanical absorption from without, or is it designed to excrete from within? Can it be said to be homologous with that remarkable system of cutaneous follicles (the bases of which being here turned outwards, the neck being directed inwards) which crowd the entire surface of the body in nearly all the turbellaria, and which almost equal in size the membranous processes on the tegumentary surface of the asteridæ? or is it a distinct and special formation? Neither of these questions can be at present solved with certainty. The author, however, strongly inclines to the view which regards the vesicles in the light of *absorbent organs*, as provisions specially destined to replenish the general cavity of the body with fluid. The parietes of each vesicle are studded with minute granules. In no single instance is it possible to discover a "nucleus" such as that which Meissner has described in the falsely-called vegetable celled parenchyme of *Gordius* and *Mermis.* But if this vesicular tissue is *not* an absorptive apparatus, what other means exist for the exercise of this function? Is there any peculiarity in the walls of the intestinal tube which is capable of answering such an end? The wall of the alimentary canal in the nematoids is formed on the type of that of the annelids.

It presents no trace whatever of a vascular system. It is composed of a peritoneal layer, of a very slender muscular, and of a glandular layer (fig. 13). The biliary cells are nucleated capsules filled with molecules. The intes-

tinal wall in the sepuncles is studded with peculiar *ciliated* follicles, the object of which is obviously to take up rapidly from the alimentary canal the liquid required to replenish the chylaqueous fluid. But of such structures no examples are to be discovered on the intestinal walls of the nematoids.

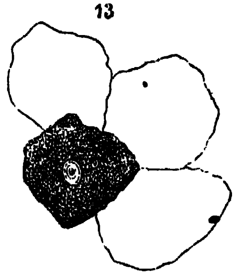


Fig. 13. Biliary cellular layer from the wall of the alimentary canal of *Ascaris lumbricoides*.

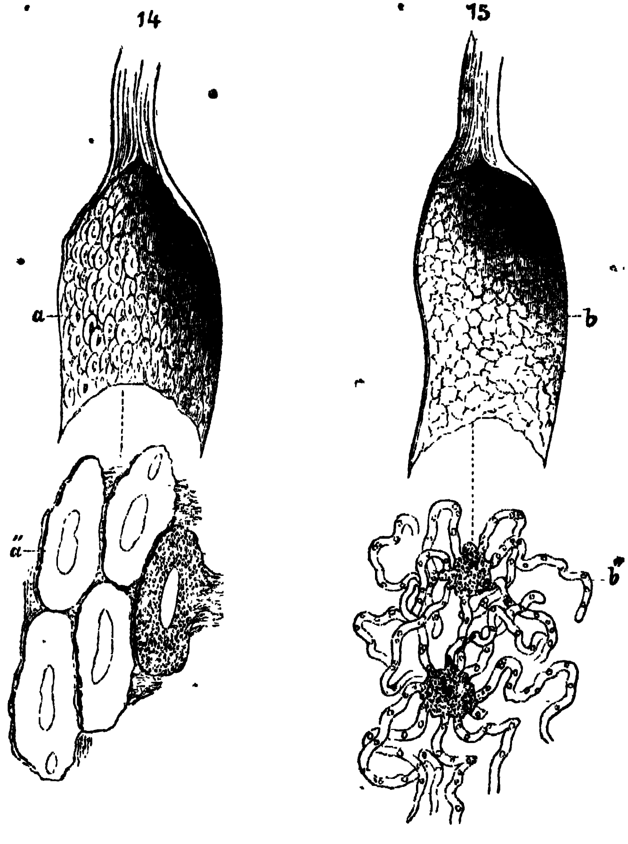
One cell is shown in the full state. The others are in outline.

In the present state of knowledge it must therefore be concluded, from the absence of all apparatus at the mouth for sucking, from the immovably fixed and straight alimentary canal ill-adapted thus for holding large quantities of fluid, from the external circumstances under which they live, from the peculiarly suitable structure and arrangement of the vesicular tissue, from the known absorptive capacity of the integuments, that in these worms *a very large proportion* of the cavitary fluid is derived directly by absorption from without at the tegumentary surface of the body.

The author is desirous to introduce one more illustration of the histomorphous capacity of the solids in these lowly-organized beings before proceeding to a special consideration of the fluids. Out of one common source, the fluids, different solids are moulded in the lowest as in the highest organisms. In this process of appropriation the fluids are passive, the solids are active and positive. Take corresponding parts of the same organ from Ascaris lumbricoides of the sheep, and note the extraordinary fact that beneath an exterior of perfectly similar conformation there lies a singular histological difference.

The testis of the male has the same general conformation as *one* of the tubular ovaries of the female. Both commence in a slender cæcal tube, which slowly grows larger and thicker until it reaches a dilated portion, which in the female is the uterus, fig. 14 *a* (Nelson); Eiweiss-schlauch (Meissner); in the male, the vesicula seminalis (Nelson), fig. 15 *b*. Dr. Nelson has most accurately described the female organ, but neither he nor Meissner alludes to the following interesting peculiarity in the structure of the male organ. If the *lining membrane* of the male and female organ be compared *stage for stage*, commencing at the fine cæcal end, and ending at the dilated portion, it will be found that at the first stage (that at which the germinal vesicle is formed in the female, the nucleus of the sperm-cell in the male), the *mucous or lining membrane* is precisely the same in both; at the second (corresponding with the "Dotterstock" of Meissner, and the Vitellarium of Nelson), the lining cells of the membrane in the female tube have increased in size, but are still oval in form, having a very conspicuous nucleus; in the male tube they have a very distinct pyriform shape, being attached to the sides of the tube endwise, forming thus a villous coating; at the third stage (uterus, Nelson; Eiweiss-schlauch, Meissner), the two series of cells are found to have diverged from each other to a remarkable degree (compare *a''*, fig. 14, with *b''*, fig. 15). In the female series (*a''*, fig. 14), the cells have deviated little from their original form; they are still large elliptical bodies, having a very evident

clear nucleus in the centre, the space between it and the involucrum being filled with granules. In the male tube at the same stage the cells have acquired an extraordinary spider-like form. The nucleus is so small as scarcely to be detected, but the membrane of the cell-wall (b'', fig. 15) has thrown out singular pseudopod-like processes, which,



Cells of the mucous lining of the female (fig. 14) and male (fig. 15) generative tubes of *Ascaris lumbricoides* of sheep.

a. uterus of female, laid open, showing the large ova-like cells on the internal surface. At *a''*, a few of these cells are represented, still further magnified.

b. Seminal vesicle of male, opened, in order to show the peculiar cells by which it is lined.

b''. Two or three cells, enlarged.

when the cells are *in situ*, mat themselves together into a thick felt with those of the adjoining cells. These processes are *hollow*, and contain the same granules as those which are seen in the centre of the cell. Higher up in the tube they are projected only from *one side* of the cell. Thus, as the generative tube is traced downwards, they gradually grow from the pair-like into the crab-like form.

These cells respectively constitute the producing or stromatous tissue in the male and female generative tubes. They demonstrate two directly opposite modes of growth in cells—one centripetal, the other centrifugal—one in which the nucleus and contents increase, the other in which, *at the expense of the nucleus and contents*, the cell-membrane acquires a considerable development.*

They show that from a common starting-point two series of cells, produced by tubes of apparently the same precise structure, and by one and the same nutritive fluid, may yet conceal beneath identical exteriors formative powers capable of impelling them, in the march of growth, towards two widely-separated destinations. Such *facts* convey to the physiologist, though distant, yet correct conceptions as to the nature of the "vital force." Certain elements of the blood pass through a simple membrane, yet in one case they emerge as the germ, in the other as the sperm-fluid! But how remarkable it is that the fluids of the lowest animal should be endowed with the same histomorphic power as those of the highest! In both cases, a plain incomplex membrane attracts a protoplasm out of the fluids which *cellulates* into the same germinal vesicles! It follows, that in one sense the fluids of the lowest animal are equal to those of the highest,—that the same elements are present in both. When the physiologist has acquired a correct knowledge as to the number and variety of solid organized parts which the fluids in any given case are capable of producing, he has reached a point of information which no analyses of the fluids themselves would enable him to attain.

A strong argument in favour of this conclusion will afterwards be drawn from the character of the solids in the trematode, cystic, and cestoid entozoa.

The nematoid entozoa, as already stated, are destitute of every trace of a vascular system. An apparatus of vessels in these worms is, notwithstanding, described by all authors. Too trusting confidence has been given to the delineations of Emile Blanchard. They were taken from artificial injections. They have deceived both the operator and his admirers. The proof of the absence of a vaso fluid system rests upon two methods of examination: in the larger specimens, by dissection and by the microscope, in the smaller, by directly viewing the body as a transparent object.

In this family of worms there exists only *one system* of fluids—which, for brevity sake, may be called the *cavitary system*—in contradistinction to the vaso or vascular system, so often present in the annelids. It is contained in part in the free chamber of the peri-visceral space, which, in the nematoids, as formerly explained, is in all species narrowed, in some almost obliterated, by the encroachment of the vesicular tissue, in part in the vesicular tissue. There is one very marked peculiarity about the cavitary fluid of this class of worms—namely, *that it is altogether destitute of every form of floating corpuscle.* This is the only example of such a peculiarity that the author is acquainted with in the whole history of

* I wish the reader to understand that this is a mere *mode of expression* with reference to the growth of cells. It is highly probable that the views so ably advocated of late by Mr. Wenham will oblige physiologists to substitute for these old modes of expression a more exact terminology.

the *cavitary*-fluid system of the invertebrata. It is the rule as regards the vaso-fluid system of the annelids. So little is known of the nutritive liquids of the trematode and cestoid entozoa, that at present it cannot be affirmed with certainty whether they are corpusculated or not. The cavitary fluid of the nematodes consists of a smooth, oily, homogeneous liquid, having a slightly yellow tinge, and entirely amorphous under the microscope.

It is probably of high specific gravity, as it is of great apparent density. It strongly resembles the *serum* of the blood of a vertebrated animal. It looks very much more as if it were sucked directly into the body of the parasite, than as the product of the digestive agency of an animal so low in the scale. Sufficient quantity in the larger ascarides and strongyli may be readily collected to test its chemical properties. It is a *thick solution of albumen.* If placed in a clean watch-glass, *no coagula* of any description are formed under any circumstances. It leaves a dense smooth skin of solidified albumen on the glass, after complete evaporation. Acids throw down a thick body of albumen. From these facts the inference may be drawn that this fluid *does not contain fibrin* or any analogous self-coagulating principle. Why should the cavitary fluid of the nematodes possess these remarkable characters? Why should it be so much more rich in albumen than its homologue in the annelids, the latter animals being so much higher than the former in the scale? The chylaqueous fluid of the annelid is a watery corpusculated fluid; the cavitary liquid of the nematodes is as dense as the serum of a vertebrate animal. Is it not beyond doubt that, in both cases respectively, the fluid owes its properties to those of the medium from which it is drawn? The annelid lives in water, the nematode in blood! But the fluids of the nematode worms are *motionless, stagnant in the body!* In the annelids they are in constant movement. This is a peculiarity still more striking than the former. The fluids are sluggish, like the parasites themselves. The chemist will at once see that *motion* is an important accessory to all chemical operations. If the densely albuminous cavitary fluid of the nematodes were the product of blood-making processes, having their seat exclusively in the body of the worm, is it not wonderful and contrary to all analogy that these processes should not be accompanied by the mechanical circumstances of *motion?* Why there is no motion of the fluids, it is easy at once to understand. The intestine is so completely tied to the integument, that it can neither roll laterally, nor lengthen and shorten in a longitudinal direction; but the epidermis is so leathery and inflexible, that no liberty of motion is possible in any of the enclosed parts. The integuments of the nematode do not exhibit that undulatory movement which, in the sipuncles, drives the cavitary fluid incessantly and with great force from one end of the body to the other. The absence of fibrin from the nutritional fluid of these entozoa associates itself (causally?) irresistibly with the low development and sluggish character of their muscle-system. The absence of the mechanical circumstances of motion may, too, explain the absence of corpusculation. The vesicular tissue, and its undoubted absorptive power, cannot be separated from the fact, that the fluid by which that tissue is filled resembles most closely the serum of the animal upon which the worm is parasitic.

ART. II.

Influence of the Climates of Peru on Pulmonary Consumption. By ARCHIBALD SMITH, M.D.

THE various climates of Peru, as changed or modified by the measure of elevation from the sea, and other local causes, are not merely curious to the meteorologist, but more especially interesting to the physician; they are, above all, important in relation to the development in some localities, and the disappearance in others, of phthisis; this point I shall now endeavour very shortly to illustrate.

1. *What are the Localities or Climates in Peru in which Phthisis is most and least Prevalent?*—This disease is properly a product of the warm and humid valleys of the coast, such as that of the Rimac. And from Lima, where you have an extensive view up this valley, to the loftiest snow-clad peaks of the Cordillera, every gradation of climate is unfolded in the intervening distance, that one would have to pass through, in a voyage of many days, from Callao to Cape Horn. And in the inland glens beyond (as in the often-mentioned vale of Huanuco), we have noticed how the extremes of climate are brought within much nearer limits than those embraced even in this picturesque and imposing bird's-eye-view from Lima—especially from the bridge, looking eastward. Nor is there, in all this range of climate, a locality in which phthisis is more prevalent than in the mild and equable temperature of the capital and its immediate environs.

Piura, the most northern province of Peru, though within two or three degrees of the endless moisture and vegetation of the Equator, is yet the most hot and arid in the republic. Its maritime district is also considered the most healthy on all the coast, and remarkably free from pulmonary disease or consumption. In the pastoral sierra—viz., on the lofty slopes and colder plains of the Andes, pleurisy and pneumonia are not unfrequent; and sometimes terminate in the worst manner, by suppuration or gangrene, when left, as usually happens in remote Indian villages, without medical assistance.* Phthisis pulmonalis is, I am persuaded by a long residence in these mountain regions, little known to the native population, except as imported to the hill-land from the coast. In those warmer valleys in the centre of the Andes, where the temperature is sufficiently favourable to the growth of the banana and sugar-cane, we meet with frequent development of hepatic disease; and when the climate is particularly warm and humid, as in the province of Huamalies, on the borders of the Montañer, we even meet with severe examples of ague; and these situations are but ill calculated to restore the health of a consumptive invalid. I resided for several years in the vale of Huanuco, which—as previously mentioned—is dry, and free of

* The Indians have many native remedies for what they call *dolor de costado*, or pleurisy; but I found, in Cerro Pasco, bleeding, followed up by tartar emetic, most efficacious. In the Sierra, bleeding is better supported than on the coast, where twelve ounces of blood is a large bleeding among the white Creoles. In Lima, where the lancet cannot be used safely, tartar emetic, pushed in small doses, alone or combined with morphine, to the extent of from twelve to twenty grains, generally subdues either pleurisy or pneumonia.

malaria, at an elevation varying, as it extends along the banks of the river, from six to seven thousand feet above the level of the sea, with the thermometer rarely, throughout the entire year, above 72°, or below 66° Fahr. in the shade. But this climate, though equable, did not prove favourable to the convalescence of phthisical patients brought there from other parts of the country; and I cannot say that I ever saw a case of phthisis originate in that locality. In like manner the cold—often damp and variable, and always highly rarefied—atmosphere of the mining district of Cerro Pasco, and other localities near the snow-line, is unfavourable to recovery from phthisis. But Huarriaca, which lies in the descent from Cerro to Huanuco, is very favourable to such recovery, as I had frequent occasion to test when at the mines; whence we usually sent our patients from pulmonary affections to convalesce at this desirable place, distant eight leagues of pretty rapid descent from the silver mines of Cerro Pasco. Huarriaca is in climate very like Obrajillo, on the western slope of the Andes, and is one of those recesses in the Andine glens and defiles very productive in maize, corn or wheat, potatoes, beans, and natural pastures on the heights, as well as cultivated lucern on the straths. Such, indeed, are the marked localities, blessed with a steady temperate climate, and a dry air of about 60° Fahr. in the shade, as well as sunny cheerful sky throughout the greater part of the year. Such are the localities where phthisis proper, or tubercular disease of the lungs, is only known as an exotic!

2. *The Proportion of Deaths by Phthisis compared to other Diseases on the Coast of Peru.*—This proportion, for want of satisfactory statistical returns, can only be answered at present in respect to the capital, and even there only approximately. From data before me—let us take the mean of ten years, say from 1841 to 1850, inclusive,—the average may be struck at 3200 deaths annually, of all diseases, in Lima. Of this gross sum, the monthly hospital returns account for 1700; while a somewhat less proportion—viz., 1500, are indiscriminately entered in the report of the general cemetery under the title "various diseases." But from the more specific evidence as to details, furnished by the hospital reports, I will here state the average mortality for the ten years, given, in 1700 cases yearly, as follows:

From fever	600
From dysentery and chronic diarrhœa	480
From pleurisy and pneumonia	160
From phthisis pulmonalis	320
From sundry other diseases	140
Total	1700

Thus, next to fever and dysentery, phthisis was the most fatal disease known in Lima up to the first visitation of yellow fever in that country, from the years 1851 to 1854, as described and recorded by me in No. 203 of the 'Edinburgh Medical and Surgical Journal,' but with which, in our present estimate, we have nothing to do. If it can be shown in this way, that in 1700 hospital cases of fatal termination annually, 320 of these deaths proceed from phthisis, we arrive at an average proportion for the whole mixed population of Lima admitted to

hospital treatment. And further, if we put to one side the indefinite number of deaths from infantile diseases, among the 1500 indiscriminately sent from the different parochial wards of the city, and included under one common head—viz., "various diseases;" there appears no reason why, among the remaining adult population included in the said gross parochial deaths, as distinct from the more detailed and special hospital returns, the ratio of deaths from phthisis, *as compared to other diseases*, should not be approximately the same as it is found to be in the 1700 who died in hospital, where the proportion has been pretty reliably ascertained as above, to be about 3 in 17.

3. *In what Stage or Form of Phthisis is it found Curable by a Change from the Climate of the Coast to the Sierra?*—On the coast generally, the most usual exciting cause of pulmonary affections is observed to be some check to the perspiration (*resfrio*); and not only pulmonary complaints, but rheumatisms, diarrhœa, and fevers acknowledge this origin. It is more particularly in spring that we see the effects of this *resfrio* in hospitals crowded with patients under the influence of febrile catarrh, pneumonia, pleurisy, and phthisis pulmonalis. When the frame becomes much debilitated, and especially when the patient is convalescing from some prior ailment, it is a familiar event that, under these circumstances, incipient phthisis presents itself in the form of such admonitory symptoms as growing debility, failing appetite, a slight dry cough, feverish pulse and heat, with restlessness and wakefulness by night.

In the dry and sultry summer months cases occur under a different aspect, in which, from the beginning, the gastric system is more ostensibly disordered. The tongue whitish-coloured and furred; evening fever and sleepless nights; a short dry cough; depression of spirits, with a foreboding of pulmonary consumption or hæmoptysis on the part of the invalid, are so many symptoms which attend this form of attack. In all cases, whether originally of the gastric or pulmonary type, the patient or physician must not waste time in the employment of unsuccessful special remedies. And the plain reason of this practical admonition, which indeed amounts to a popular maxim in Peru, is that a change from the coast to the mountain climates, graduated as the case may require, will do more to restore health than all the drugs within their ken; and that, if this easy migration be too long deferred, confirmed as well as hopeless phthisis will be the end of disorders so initiated on the coast.

But though it be here necessary to characterize such examples as the above, in pointing out the introductory forms which phthisis assumes in Peru; yet it is important to bear distinctly in mind, that the most common prelude, as well as attendant, of the Lima phthisis pulmonalis, undoubtedly is hæmoptysis; to which there appears to be a remarkable predisposition among all the mixed classes and races of the population, particularly in the white, Creole, and brown females of preponderating Indian caste. The healthy, full-chested, mountain Indian mother, if engaged in the maternal duty of suckling her young on the coast, often acquires a predisposition to hæmoptysis, to which she had shown no tendency whatever so long as she lived and nursed on the mountains. On the hill-land the ordinary functions of the digestive organs are vigorously exercised; while on the coast, the long-continued influence of a

warm and humid atmosphere not only keeps up a relaxation of the skin, but induces a more languid appetite, and a less perfect and healthy action of the stomach and bowels, &c., which soon tells on the whole system. Europeans soon become lazy, and unwilling to take exercise on foot, in the Lima climate, and suffer a great, though gradual, loss of nervous and muscular power. The offspring, especially the male offspring, of the athletic Spaniard, grows up a comparatively delicate man; but the negro race thrive well on the coast, and retain the muscular power of their progenitors. The white family always suffer more or less from a protracted residence in Lima, where congestive diseases are sure to arise in this race; and more particularly the prevailing disorders, hæmorrhoids, blenorrhœa, dysentery, &c.

Whenever hæmoptysis shows itself in Lima—which it often does in the Creole ladies after an evening party (*tertulla*), without any previously perceived sign or suspicion of so great a misfortune—the circumstance is always one of alarm.

The spitting of blood may be very slight at first, and attended with a slight cough; and from so apparently simple a beginning, experience and common observation lead the patient, friends, and physicians together, to fear the approach of phthisis, unless the hæmoptysis and cough can be speedily subdued. As a general rule, in such cases, phthisis is always suspected to lurk in the background, unless its incubation be promptly checked by a change of climate. The ordinary result is, that those so circumstanced, especially when of the delicately-organized, fair, Creole race, very rarely trust to medicine or to the assistance of the physician, but at once order the mules and other necessary arrangements for a journey to the interior. It is only by this decided conduct that they hope permanently to guard against a future and more formidable return of hæmoptysis, with its phthisical consequences; and they seek at first notice of the disease to insure a full reparation of the injured respiratory organs, by an adequate continuance in the well-known and appropriated regions of convalescence.

When cases thus inaugurated—which are far too frequent in Lima and other parts of the coast of Peru—go on for a few weeks, not to say months, without decided amendment under medical treatment, we may expect to find on examination positive signs of pulmonary consumption. Now, then, besides occasional returns of hæmoptysis more or less developed, varying from coloured sanguineous sputa, to mouthfuls or even cupfuls of blood at a time, there is also more or less cough, soon attended by some degree of pain in the chest; depression of spirits, failure of appetite, with loss of flesh, and lassitude; some notable change in the respiratory sound, or perceptible deviation from the normal murmur, with almost always obscurity of sound on percussion under either the right or the left clavicles. No Lima junta of experienced native or well-acclimated European physicians, would for a moment hesitate to order to the sierra a patient in the condition I have just described. They would deem this transfer of climate as the only security for the patient.

Under such conditions I have witnessed the application of all approved European remedies of every school fully tried, where the phthisical patient was, for one reason or another, destined to run his course on the coast

and in the capital, under the eye of able assistants, but always with the same fatal termination.

Cod-liver oil, extensively used of late years, has appeared to alleviate the pulmonary symptoms, by improving the habitual state of the digestive organs, and, as far as I know, it did no more in that country, whatever may have been its success in Europe.

I have sometimes seen cases of pneumonia, imperfectly cured, terminate in chronic phthisis, on the coast of Peru. I have also met with cases of passive and chronic hæmoptysis sustained by pulmonary congestion, or consequent upon heart disease, which never passed into phthisis. But such cases are easily distinguished for the most part, and I may just say in passing, that small doses of spirits of turpentine—say twenty drops thrice a day—have been useful in stopping these passive forms of pulmonary hæmorrhage.

In advanced stages of phthisis, attended with opaque and purulent sputa, colliquative sweats, bronchial and cavernous respiration, with all the aggravated symptoms of hectic fever—even in such a plight, the change from the climate of Lima or the coast to that of the Andine slopes (at moderate elevations relatively to the snow line) has been known to prolong life for years, and allow the patient renewed strength to return from time to time to the coast, with marked improvement in general health, as well as in the condition of the lungs, and quite free from fever. But after a few years, such partial convalescents have succumbed to a fresh accession from cold or other exciting cause. But while I state these facts, and could cite individual instances in point, it should never be forgotten that the timeous removal to the sierra is intended to prevent the advancement of phthisis beyond its first initiatory stage in the hæmoptoic form of invasion so prevalent in Peru, or to cause it to retrograde altogether, even from this primary condition. It must be clearly understood, therefore, that I claim the curative effects of the Andine climates, on the broadest grounds of facts and experience, in favour of the early stage only, and not the more advanced periods of pulmonary consumption, when there is, correctly speaking, no sound lung to rescue.

4. *What are the Inland Localities in Peru approved as the Best for Convalescence from Phthisis?*—I shall speak of the localities best known in, and most convenient to, the capital; other inland positions of corresponding temperature will naturally be resorted to from other points of the coast, according to their contiguity. On the Pacific slope of the Cordillera, and by the Pasco road from Lima, Haraway (usually pronounced Yaraway) and Canta are considered the best localities; and Huamantanga is also considered favourable; but Canta above all, on this route, is allowed to be most desirable, being about twenty-five leagues from Lima, and at an elevation of 10,000 feet, on a height overlooking Obrajillo, which latter is in a hollow locked in by hills, and about 1000 feet lower than Canta. Again, by the Zarma road from Lima, Matucana and San Mateo are favourable climates; the former, according to McLean, is 8026, and the latter 10,984 feet high; and of the two, Matucana is considered the best. But Canta is found preferable to either as a place of permanent convalescence. Culluay, enclosed in a basin-shaped hollow a few leagues above Obrajillo, on the Pasco road, is 12,000 feet above the sea, and

corresponds in climate with Chicla, a few leagues above San Mateo on the Zarma road, and at an elevation of above 12,000 feet, according to McLean and Herndon's reckoning. Both these localities are hostile to the phthisical patient.

When it is determined to pass the Cordillera for convalescence, this is usually done by the pass of Yauli or by Tucto, to the temperate valleys of Zarma, Jauja, and Huancayo. The elevation at the pass of the Viuda mountain above Culluay on the one hand, and of that of Antarangra (also called Antacona) above Chicla on the other, is nearly equal, as far as can be determined by the measurements of different observers. McLean gives the one at 15,543, and Rivero the other—viz., that of the Viuda, at 15,500; the Viuda being 15,968 feet—just 1000 feet above the line of glaciers or permanent snow. Across the Cordillera gates or passes (Portachuelas), the patient, if very weak, is conveyed in a litter, and if his direction be Pasco, he cannot remain there, but must at once pass through to Huarriaca, a climate quite analogous in temperature to that of Obrajillo, only with better ventilation. But physicians from Lima always send their phthisical patients (when ordered across the Cordillera) to Zarma and Jauja as the great sites of convalescence; and on the way to these celebrated localities, Matucana is the favourite resting place of phthisical and hæmoptoic patients. It is at this point, in the headland of the valley of the Rimac, enjoying a mild atmosphere on the confines of the air of the coast and the sierra, and just within the rain line, without being yet too wet or cold, that the invalids alluded to receive the first kindly impressions of improving health, and after a longer or shorter stay here, proceed to those more favourable climates, in higher elevations, beyond the first Cordillera.

I should state expressly, that the extensive valley of Jauja, rather cooler in temperature, and also of a few hundred feet more elevation above the sea than Zarma (which Herndon gives at 9738), is allowed to have a decided superiority for the recovery of the hæmoptoic and phthisical invalid. The climate of this locality is temperate, and productive of a great variety of grain and green crops. But for the cure of phthisis, the Montana climate, for at least eight months in the year, is too damp, and if the patient be not careful in ordinary ablution—which natives prefer doing when the sun shines—the body is apt to be chilled. Lieutenant Herndon experienced this effect after bathing, and cautions his readers on the subject.

I shall conclude these observations by endeavouring to solve an important problem bearing intimate reference to our present inquiry, and which I find suggested in Dr. James Copland's very elaborate and instructive article on Tubercular Phthisis, recently published in Part 17 of his valuable 'Dictionary of Practical Medicine.'

The problem I allude to is contained in the following extract:—

"Having ascertained the frequency of the disease in the aborigines of a country—or climate, it is next of importance to know how far that frequency may be modified, diminished, or increased by change to other countries, either colder or warmer, or of higher or lower elevation, &c., and by the adoption of different food and other habits." (p. 1130, sect. 205.)

I beg the reader's attention to this quotation. I hope I may, without any undue pretension, be allowed to say that I feel not only

authorized, but called upon as a matter of duty to record on this head the result of my long experience in different climates of Peru. I shall therefore remark that, as regards the native white Creole and the brown races of mixed blood, this problem may be considered as solved in cases of incipient phthisis pulmonalis attended with more or less hæmoptysis. By change to other countries—for example, to Chile, which is colder, or to Guayaquil, which is on the *Equator*, and consequently warmer—the effect on the patient from Lima has been so often tried and found injurious, that this is a change of climate which no experienced resident physician would venture to recommend. But by proceeding inland to the valley of Jauja, at the elevation of ten thousand feet above the sea, such incipient phthisical cases—especially of the hæmoptoic type, as I have defined—are always relieved, and almost always cured, provided the patient remain long enough in the uplands to insure this result.

Time is required to bring about a radical organic change, for when individuals apparently quite recovered in Jauja descend to the coast, and particularly to the capital, within a few months the hæmoptic and other phthisical symptoms have been observed to return, rendering a longer residence in the sierra necessary to insure a permanent cure. A year's sojourn in the sanitary climate of the hill-land is usually considered indispensable in serious cases which have demanded a transandine climate. Milder cases and slighter indications of pulmonary disease, with tubercular development, often yield to a few months' residence at Matucana, Haraway, or Canta, on the western slope of the Andes, and not far from the resources of the capital.

The unvarying experience of centuries, perfectly relied upon by the natives, proclaims this change from the coast to the sierra climates, to afford undoubted beneficial results to the native white, as well as the diverse shades of brown and olive races of the coast, when labouring under hæmoptysis or pulmonary consumption. The negro is less subject to phthisis, and also reluctant to encounter the bracing air of the Cordillera; his favourite element is the warm and humid air of the coast. The influence of race in the cure of disease is wisely considered by Dr. Copland as of greater importance than has been yet bestowed upon it. In Peru, I found this truth constantly illustrated in practice. For instance, in dysentery, calomel and opium properly and timeously administered, are almost infallible in the Indian race, in the white far less certain, and in the negro cannot be depended upon at all. In yellow fever, turpentine cured as many as fifty per cent. of Indians, apparently in a hopeless condition, being sent to the Lazaretto, as it was believed, in an incurable state; but in the whites, turpentine, as administered by us in Peru in the year 1854, was of comparatively little power; and as for the negroes, we had no opportunity of ascertaining its effects, since in them this malady, so fatal to the whites, was scarcely experienced, except as a slight fever with headache, which by the aid of common enemata passed off in a few days, leaving no bad symptom or dregs of disease behind it.

But as regards phthisis, which we have been considering above, I have always seen cases of the character described by me turn out well through migration to the sierra. And I may truly say, that from my own long experience in Peru, and knowledge of these cases, I could easily

recount a multitude of permanent cures, also familiar to many native physicians.

This result, as far as the natives are concerned—a goodly mixture and variety of races, we must admit—is simply conclusive matter-of-fact; and now that the communication by Panama is so easy, it may be worth while to test the effects of the Andine climate of Peru on the European phthisical invalid. I had little opportunity to do so with the English under my charge in that country, but as far as my experience went, it was as favourable to the European as to the native Creole. But allowances, no doubt, must be made for different habits of life and other causes. The benefit received by Peruvians in the instances in question are too evident to admit of cavil, nor can the good effects be explained on the score of mere change of scenery and the pleasures of travelling. All coast-born Peruvians leave the neighbourhood of the sea and their native towns—above all, Lima—with extreme reluctance, and look upon the sierra as a kind of Siberia—a place of privation and exile. But in spite of all these prejudices and dislikes, when they realize the change to the sierra, they are constantly seen to recover there, under conditions of pulmonary tubercular disease which would undoubtedly terminate fatally, and that very soon, on the coast.

On the mountains, the Limeñian habits of diet are necessarily somewhat changed, and the invalids are naturally led to more exercise in the open air; but yet their in-door habits, with their gambling propensities, will ever predominate, whether on the hills or coast. Cards and dice, indeed, are esteemed not merely an amusement, but an indispensable part of a genteel education.

The air of the mountains—in those elevated localities pointed to as suitable to the recovery of the phthisical invalid—is free from the malaria of the coast, and (as we have already learnt) clear, light, cool, and invigorating — alike removed from the extremes of cold or heat, and, upon the whole, remarkably equable.

On the coast, the natives continually drink in abundance cooling acidulated beverages, as lemonades, pineades, &c., and the classes in better circumstances (under the idea that a weakening climate needs strengthening food) use much more animal food than a climate so mild, with an indolent life, would seem to require. Indeed, all grades of the population consume great quantities of lard and pork, and also of fish fried in pans of boiling lard. This kind of cooking goes on in the open squares, corners of streets, and market-places, every evening and morning, for the convenience of the populace or lower classes, who thus feed in the open air at small cost of money and free from domestic trouble. Sweets, pastry, and fruits they eat at all hours, irrespective of their regular meals. On the removal of invalids from such a population to the sierra, the same facilities do not offer. The mountain diet is necessarily more simple, and the habits of life there assumed for the time are more in unison with those of the rural population of the district.

Art. III.

Annual Report of Cases admitted into the Medical Wards of St. George's Hospital during the Year ending December 31st, 1855. By G. Goddard Rogers, M.D., Medical Registrar to the Hospital.

This Report is the fifth presented to the governors of St. George's Hospital since the adoption of an uniform system of registration of cases. The method of classifying and tabulating the various diseases was explained by Dr. Barclay, the former registrar, in his Report for 1853, and a few remarks were also added to show the difficulties in the way of adopting the system of the Registrar-General unchanged. During the past year the cases were taken on a rather more extended plan; and in the classified Index of Diseases, by Dr. Barclay's advice, two fresh subdivisions are made in Division 22—Diseases of the Brain and Spinal Cord, to which allusion is again made in the remarks on this class of affections. Gout and Rheumatic Gout are also separated for the first time. In all other respects the method of registration is the same as during the preceding four years, and no pains have been spared to render this Report as accurate as possible. But the co-operating aid of other metropolitan hospitals is needed before any great statistical facts can be educed respecting the prevalence of various diseases at certain periods, and their more or less favourable rate of mortality.

Cases admitted during the year 1855.						Admitted during five years.	
Nature of Disease.	Admitted.	Died.	Per-centage of mortality.	Complicated with other diseases.	Deaths among complicated cases.	Admissions.	Per-centage of mortality.
1. Fevers:							
Continued fever	188	17	9·04	76	12	747	11·3
Influenza	24	...	...	7	...	61	...
Remittent fever	1	1	?	1	1	1	?
Asiatic Cholera	...	...	...	...	...	140	49·3
2. Eruptive fevers:							
Measles	2	...	...	1	...	19	...
Scarlatina	23	2	8·69	6	...	66	15·1
Varioloid	...	...	...	...	...	16	...
Erysipelas	30	4	13·3	10	3	124	16·1
3. Intermittent fevers:							
Quotidian	4	...	...	1	...	22	...
Tertian	5	...	...	1	...	37	...
Quartan	...	...	...	...	...	5	...
Irregular	3	...	...	1	...	10	...
4. Rheumatism:							
Acute	77	2	2·59	41	...	332	3·89
Subacute and slight	108	3	?	37	3	514	?
Chronic	133	1	?	45	1	683	?
5. Gout:							
Gout	11	3	?	4	3 }	141	...
Rheumatic gout	24	...	...	5	... }		
6. Poisoning:							
Irritant	1	...	...	...	...	10	20·0
Narcotic	...	...	...	...	...	7	14·3
Gaseous	...	...	...	...	...	2	...
Syphilitic	6	...	...	1 }	...	47	...
Gonorrhœal	5	...	...	4 }			
Hydrophobia	...	...	...	...	...	...	...

Nature of Disease.	Cases admitted during the year 1855.					Admitted during five years.	
	Admitted.	Died.	Per-centage of mortality.	Complicated with other diseases.	Deaths among complicated cases.	Admissions.	Per-centage of mortality.
7. Colica pictonum	7	...	...	2	...	37	...
8. Entozoa:							
Intestinal worms	3	1	?	1	1	22	?
Echinococcus hominis	...	...	...	...	...	2	100·0
9. Dropsy:							
Anasarca	109	37	33·9	102	36	510	35·1
Ascites	14	8	57·0	13	8	84	51·1
10. Hæmorrhages:							
Epistaxis	4	1	?	1	1	19	...
Hæmoptysis	18	4	22·2	10	4	97	24·7
Hæmatemesis	9	.	...	1	..	30	13 3
Hæmaturia	8	2	?	6	2	36	11 1
Intestinal	5	1	20·0	4	1	39	17 9
Uterine	12	...	...	3	...	35	.
11. Purpura	1	..	..	..	...	25	32·0
12. Scurvy	1	.		..	...	6	
13. Anæmia	74	1	?	42	1	328	1·82
14. Chlorosis	19	.		7	..	98	
15. Cachæmia	6	2	33·3	3	1	41	41·1
16. Scrofula	16	6	37·5	10	6	55	18·1
17. Tubercular diseases:							
Phthisis	153	35	22 8	83	25	604	33·8
Tubercles in brain	1	1	100 0	2	2	13	92 3
Accretions in peritoneum	2	2	100 0	2	2	22	16 3
Tabes mesenterica	..	..	..	...	...	...	...
18. Morbid growths:							
Hydatids	3	1	33·3	1	1	10	70·0
Encephaloid	12	11	91·6	10	10	48	72 9
Scirrhus	17	4	23·5	2	2	102	17 6
Epithelial cancer	1	1	?	..	...	1	?
Colloid cancer	..	..	...	.	...	..	...
Tumours of bone	.	..	..	.	...	2	...
19. Hysteria	48		...	13	...	263	...
20. Chorea	18	1	?	4	..	91	..
21. Delirium tremens	18	4	22·2	6	4	75	14 6
22. Diseases of brain and spinal chord:							
Cephalitis	10	9	90·0	7	6	47	85 1
Chronic disease	14	2	14 2	6	2	45	22·2
Epilepsy	23	2	8·69	11	2	140	15·0
Apoplexy	7	3	42 8	3	1	31	54·8
Functional disturbance	24	.	...	2	...	197	3·53
Coma and convulsions	3	2	66·6	3	2	...	...
Insanity	4	...	...	1	...	...	...
Inflammation of cord	3	1	33·3	2	1	13	44·4
23. Tetanus	1	1	100 0	...	...	3	66·6
24. Paralysis:							
Hemiplegia	32	2	6·25	10	2	149	8·72
Paraplegia	14	1	7·14	6	1	99	13·1
General paralysis	3	...	...	...	...	...	...
Local paralysis	22	...	...	4	...	45	2·22
25. Neuralgia:							
Tic douloureux	4	...	...	3	...	17	...
Sciatica	11	...	...	2	...	59	...
Hemicrania	4	...	...	2	...	9	...
Angina	...	...	...	...	...	2	...
26. Diseases of the heart:							
Carditis	1	1	100·0	1	1	1	100·0
Pericarditis	16	7	43 7	16	7	73	38·3
Endocarditis	21	4	19·04	21	4	74	10·8
Hypertrophy	18	8	44·4	15	8	131	58·01
Dilatation	15	11	73·3	14	10	71	56·3
Valvular disease	72	21	29·1	66	20	296	25·6
27. Arteries and veins:							
Aneurism	10	8	80·0	3	3	27	44·4
Phlebitis	3	3	100·0	3	3	28	35·7
28. Respiratory organs:							
Laryngitis	11	7	63·6	10	7	41	43·9
Tracheitis	1	1	...	...	...	4	...

Cases admitted during the year 1855. Nature of Disease.	Admitted.	Died.	Per-centage of mortality.	Complicated with other diseases.	Deaths among complicated cases.	Admitted during five years. Admissions.	Per-centage of mortality.
Bronchitis	151	27	17·8	92	20	639	14·5
Pneumonia	71	18	25·3	45	16	236	28·3
Pleurisy	58	23	39·6	40	22	266	32·3
Emphysema	18	7	38·8	18	7	66	36·3
Asthma	4	..	...	1	. .	7	...
Pertussis	1	1	?	...	..	6	
Pneumo-thorax	...	...	...	...	...	5	80·0
29. Mouth, &c.:							
Glossitis	1	...	...	...	...	1	...
Quinsy	10	1	10·0	8	1	53	...
Enlarged tonsils	6	.		3	.	21	...
Ulceration	11	1	9·09	7	1	26	. .
Mumps	3	1	...	3	1	11	...
30. Stomach and œsophagus:							
Dyspepsia	76	1	?	41	1	319	1 25
Ulceration	5	5	100·0	3	3	11	90 9
Stricture of œsophagus	3	1	33·3	1	1	10	20·0
31. Intestinal canal:							
Obstruction	3	2	66·6	1	1	7	57·1
Constipation	20	3	?	3	3	218	.
Diarrhœa	35	3	8 57	26	2	180	7·77
Dysentery	5	3	60·0	3	3	21	42 8
Enteritis	1	. .	.	...	...	1	..
Ulceration	5	5	100 0	5	5	15	80·0
Tympanitis	1	...	...	1	..	11	.
32. Peritonitis:							
Acute	15	8	53·3	8	8	105	41·9
Chronic	9	3	33·3	6	3	64	48 4
33. Liver and gall-bladder:							
Inflammation and congestion	11	2	18·1	6	2	36	25 0
Cirrhosis	9	8	88·8	9	8	58	75·8
Enlargement	14	4	28 5	10	4	56	26 7
Jaundice	11	2	18 1	3	1	79	27·8
Abscess	3	3	100 0	3	3	...	...
Gall-stones	...	...	.	..	...	2	...
34. Spleen:							
Enlargement	8	6	?	6	6	22	45·4
35. Urinary organs:							
Nephritis	10	5	50·0	10	5	29	17·2
Abscess	3	1	33 3	2	1	11	27 2
Albuminuria	110	48	43·6	107	48	432	47·4
Cystitis	6	..	...	1	...	29	10·3
Diuresis	1	.		1	..	2	...
Ischuria	1	1	100·0	1	1	2	100·0
36. Diabetes	6	...	...	2	...	25	12·0
37. Ovaries:							
Dropsy	4	1	25·0	1	. .	23	30·4
Tumours	12	1	8·33	2	1	41	?
38. Uterus:							
Puerperal fever	1	...	...	...	...	1	...
Puerperal mania	1	1	?	1	1	1	?
Amenorrhœa	15	...	...	8	...	65	...
Menorrhagia	15	...	...	. .	...	69	...
Leucorrhœa	12	...	. .	7	...	57	...
Tumours	13	1	7·69	...	...	29	?
Prolapsus	5	...	...	1	...	26	...
Ulceration	2	...	...	...	...	2	...
Congestion	6	...	...	2	...	13	...
External organs	4	...	...	...	...	9	...
39. Bones and joints	13	3	?	7	3	47	23 4
40. Skin and cellular tissue:							
Erythema	11	1	?	8	1	63	...
Urticaria and roseola	4	...	...	3	...	17	11·7
Lichen and prurigo	5	...	...	4	...	14	...
Squamous eruptions	10	...	...	3	...	47	...
Vesicular eruptions	6	1	?	3	...	74	...
Pustular eruptions	2	...	...	1	...	26	...
Abscess; cellular inflammation	14	2	14·2	8	2	52	40·3
41. Muscles	1	1	?	1	1	2	?
42. Anomalous cases	6	...	...	...	...	27	...

Remarks.

1. *Fevers.*—In the 17 fatal cases of continued fever, 9 presented ulceration of some portion of the ileum, cæcum, or colon; 2 presented patches of unduly elevated glands; 2 were free from all lesion; whilst in the remaining 2 the intestinal canal was not examined.

The 12 fatal complicated cases are thus distributed:

4 cases were complicated with pneumonia.
1 " " " " pleurisy.
3 " " " " phthisis.
1 " " " " inflammation of brain.
1 " " " " abscess of the liver and right kidney.
1 " " " " parotitis and chronic rheumatism.
1 " " " " ulcerated throat.

The only case of remittent fever was that of a child twelve years of age. Acute peritonitis, from perforation of the lower part of the ileum, was the cause of death.

2. *Eruptive Fevers.*—One case of measles occurred four weeks after admission, when there was no evident source of infection. The patient was suffering from local paralysis. In the other case the eruption appeared the day before admission. The total number of cases of scarlatina is one less than during 1854; the deaths also are less by one.

Scarlatina appeared in one patient who had been in the hospital two months with chorea.

1 case was associated with influenza.
1 " " " hæmoptysis.
1 " " " erysipelas, rheumatism, and syphilis.
1 " " " parotitis.
1 " " " pneumonia.

Death occurred in two cases of a malignant type within forty-eight hours. The number of patients affected with erysipelas is the same as during 1854. The deaths are higher by one. In only one case was erysipelas the cause of death. The other fatal cases were associated—

1 with paraplegia.
1 " delirium tremens.
1 " phthisis and abscess of the liver.

Erysipelas occurred in a man with scarlatina who had been in the hospital a week; in a case of ascites and cirrhosis which had been under treatment five weeks; and in a case of prurigo which had been in the house three days.

3. *Intermittent Fevers.*—Bronchitis accompanied one case of tertian, and one of irregular ague.

4. *Rheumatism.*—Of the 41 complicated cases of acute rheumatism, 30 were accompanied by some cardiac affection.

5 were complicated with pericarditis.
11 " " " endocarditis.
14 " " " valvular lesion.

Among 37 complicated cases of subacute rheumatism, 3 proved fatal.

1 was complicated with valvular lesion and pleurisy.
1 „ „ „ phthisis.
1 „ „ „ albuminuria.

The only death amongst the cases of chronic rheumatism, arose from fever. (See 1. Remarks on Fever.)

5. *Gout.*—Dr. Barclay's remark in a previous Report, that "the larger proportion of cases belong more properly to what is called rheumatic gout," is verified, now the separation has been attempted; the cases of rheumatic gout being more than two to one. The presence of chalky deposit has been the guide for placing the case under the head of *gout*. In the sixth column the cases are indiscriminately added together. The same remark applies to syphilis and gonorrhœa, which are only occasionally found in the medical wards. (See 6. Poisoning.)

6. *Poisoning.*—The only case was that of a female, who swallowed a large quantity of sugar of lead.

7. *Colica Pictonum.*—Two cases were complicated; one with epilepsy, the other with subacute rheumatism.

8. *Entozoa.*—Three cases of tænia are enumerated; one, which occurred in a phthisical patient, terminated fatally.

9. *Dropsy.*—In seven cases of anasarca, death arose from exhaustion. No specific local disease was detected to account for the effusion.

In 101 cases, organic disease of the heart, lungs, or kidneys existed. In one there was extensive malignant disease of the stomach.

In 6 cases of ascites, disease of the liver or peritoneum was clearly ascertained. The other complicated cases are thus distributed:

1 was complicated with laryngeal phthisis.
1 „ „ „ bronchitis.
1 „ „ „ disease of the kidney.

In 3 the cause was not satisfactorily determined.

10. *Hæmorrhages.*—In one patient suffering from phthisis and organic disease of the heart, repeated epistaxis hastened the fatal termination.

18 cases of hæmoptysis occurred in the hospital during the past year. In 9 it was associated with phthisis; in 1 with organic disease of the heart. One case of hæmatemesis was associated with profuse uterine hæmorrhage.

In 2 cases of hæmaturia, Bright's kidney was found after death, associated in 1 with encephaloid disease of the organ. Both patients were dropsical.

The fatal case of intestinal hæmorrhage occurred in a patient with albuminuria and enlarged liver. Uterine hæmorrhage is limited to accidental floodings. Menorrhagia has been placed under Division 38, Diseases of Uterus, and includes all cases of increased menstrual secretion.

13. *Anæmia.*—Used to express those forms of impaired health and general weakness which are often found to exist after recovery from fevers, hæmorrhages, or as a result of hyperlactation. The term appears more appropriate than the vague one, so often employed, of "debility." In one anæmic patient, who died somewhat suddenly, endocarditis, confined to the left side of the septum ventriculorum, was discovered at the post-mortem examination. The liver was also considerably enlarged.

14. *Chlorosis.*—This term is restricted to cases of anæmia associated with depraved and irregular menstrual secretion.

15. *Cachæmia*—Includes all cases of unhealthy condition of blood, whether from the presence of pus, the introduction of poisons, or any other extraneous cause which materially alters the character of the fluid. Two cases under this heading proved fatal from pyæmia, which arose in one in consequence of a bite from a glandered horse.

2 other cases depended on starvation.
1 followed an attack of measles.
1 was a case of unhealthy ulcer of the leg.

16. *Scrofula.*—Of 16 patients who were admitted on account of cachexia dependent on the strumous diathesis, six complicated cases proved fatal.

1 was complicated with inflammation of the brain.
1 „ „ chronic disease of the brain.
1 „ „ pericarditis and abscess of the heart.
2 „ „ bronchitis.
1 „ „ albuminuria.

17. *Tubercular Diseases.*—In both the fatal cases of tubercles in the brain, the same existed in the lungs. Of the two cases of accretions in the peritoneum

1 was associated with chronic peritonitis and effusion.
1 „ „ cephalitis.

18. *Morbid Growths.*—In a fatal case of pleurisy, hydatid cysts were found in the liver. Epithelial cancer occurred in a man who had always enjoyed good health until two months before admission into the hospital. The first symptom was nausea, soon followed by vomiting, which persisted until within three days of his death. The disease was confined to the cardiac orifice of the stomach, and to a small portion of the left lobe of the liver.

20. *Chorea.*—In the fatal case, the spinal cord was found slightly softened.

21. *Delirium Tremens.*—In no case was the disease alone the cause of death. In the 4 which terminated fatally,

1 was complicated with epilepsy.
1 „ „ chronic disease of brain and quinsy.
1 „ „ pneumonia.
1 „ „ erysipelas.

22. *Diseases of the Brain and Cord.*—Two fresh subdivisions are made in this class of diseases—"functional disturbance" was formerly the term used to include all cases where no change of structure had occurred; consequently the range was unduly wide, and comprehended all kinds of disorder, from cephalalgia to insanity. For the latter, therefore, a separate heading is now employed; and one is added for "coma and convulsions," dependent especially on disease of the kidney.

In 3 cases of cephalitis, tubercles were found in the brain. In 1 the affection was complicated with pericarditis and disease of the kidney, in 1 with fever, in 1 with hemiplegia. In 4 of the fatal cases, tubercles co-existed in the lungs; in 4 no trace of scrofulous matter was detected. The remaining case was not examined.

In one fatal case of chronic disease of the brain, the patient was originally admitted for delirium tremens. The other death occurred in a person of tubercular diathesis.

One epileptic patient had an apoplectic seizure, followed by hemiplegia, which soon proved fatal. The second complicated fatal case was one of bronchitis and disease of the kidney, coupled with an immense carbuncle.

Of the three fatal apoplectic cases,

In 1 the kidneys were congested.
In 1 there was fatty degeneration of the heart.

The third was the epileptic and hemiplegic case just mentioned. Disease of the kidneys existed in both the fatal cases of coma. In one the convulsions supervened on chronic disease of the brain, which was found extensively indurated in many spots. The specific gravity of the healthy part being 10·55, and that of the diseased portion 10·68. Several epileptic fits occurred in one of the patients who was insane. The fatal case of inflammation of the cord was complicated with caries of the spine and nephritis.

Of the others,

1 appeared to arise from exposure.
1 " " general privation.

Both of these were paraplegic. No accurate history was obtained of the other two.

23. *Tetanus.*—Only one case was admitted, which proved fatal. The patient had been much exposed to damp four days before coming to the hospital. At the post-mortem examination the brain was found somewhat softened; a large amount of spinal subarachnoid fluid existed; and the right rectus abdominis muscle was lacerated transversely.

24. *Paralysis.*—Erysipelas was the cause of death in a paraplegic patient. The two fatal cases of hemiplegia are recorded under epilepsy and cephalitis. (See Division 22.)

Amongst 22 cases of local paralysis, 4 were complicated—

1 with measles.
1 " disease of the kidney.
1 " epilepsy.
1 " disease of the knee-joint.

26. *Diseases of the Heart.*—In the case of carditis, a large abscess was discovered in the muscular structure of the heart. Pericarditis and scrofulous disease of the hip coexisted. 7 cases of pericarditis were associated with acute rheumatism; 3 had also endocarditis; 1 carditis; in 5 the kidneys were more or less diseased.

1 was also complicated with chorea.
1 " " " " pneumonia.
3 " " " " pleurisy.
1 " " " " fever.
1 " " " " cephalitis.

Of the fatal cases—

Pleurisy co-existed in 2.
Pneumonia " 1.
Endocarditis " 1.
Carditis " 1.

Cephalitis co-existed in 1.
Albuminuria „ 3.

Endocarditis was associated in 16 cases with acute rheumatism. 2 fatal cases occurred in anæmic patients. (For the account of one, see Division 13.) The other cases were complicated with pericarditis and dilatation, together with albuminuria.

Hypertrophy was accompanied—

In 6 cases by dropsy.
„ 4 „ valvular lesion.
„ 1 „ dilatation.
„ 1 „ pericarditis.
„ 2 „ disease of the kidney.
„ 1 „ phthisis.

Of 15 patients with dilatation—

9 had disease of the kidney.
6 were dropsical.

72 cases of valvular disease came under notice, 19 of which were complicated with dropsy, and 13 with disease of the kidney.

27. *Bloodvessels.*—An unusual number of aneurismal cases was admitted. Of those which terminated fatally—

1 was associated with pleurisy.
1 „ „ „ bronchitis.
1 „ „ „ dropsy and disease of heart and kidneys.

In the other 5 internal hæmorrhage was the immediate cause of death.

Aneurism of some portion of the thoracic aorta occurred in 8; in 1 the abdominal portion of the vessel was affected; the other was an aneurism of the right subclavian artery.

Phlebitis was fatal in 3 cases—

1 was associated with acute rheumatism.
1 „ „ „ cancer of the stomach.
1 „ „ „ ulceration of intestines.

28. *Respiratory Organs.*—All the cases of laryngitis were of a chronic nature. The 7 deaths occurred in phthisical patients. In the case of tracheitis, tracheotomy was performed two days after admission, but without success.

Of 20 fatal cases of bronchitis, emphysema existed in 14.

11 were associated with disease of the heart or kidneys.
6 „ „ „ phthisis.
1 „ „ „ general tuberculosis.
1 „ „ „ cirrhosis of liver.
1 „ „ „ encephaloid deposit in the lungs.

Pneumonia was associated—

In 6 fatal cases with pleurisy.
„ 2 „ „ disease of the heart.
„ 5 „ „ disease of the kidney.
„ 1 „ „ delirium tremens.
„ 1 „ „ jaundice.
„ 1 „ „ malignant disease of the liver.

Of 22 complicated fatal cases of pleurisy—

6 were associated with pneumonia.

6 were associated with disease of the heart.
7 " " " disease of the kidney.
3 " " " phthisis.

Of 7 patients who died from bronchitis and emphysema, pneumonia and disease of the heart also existed in 2. The fatal case of asthma was complicated with dropsy and bronchitis. In the only case of hooping-cough admitted, death occurred from exhaustion.

29. *Mouth and Pharynx.*—Glossitis occurred in one patient who had been profusely salivated before admission. The death recorded under quinsy occurred in a man who came in for an attack of delirium tremens. Chronic disease of the brain was discovered at the post-mortem examination. One fatal case of ulcerated throat occurred in a patient who had been long suffering from fever. The same was the condition of a man whose death is recorded under mumps.

30. *Stomach and Œsophagus.*—Ulceration of the stomach proved fatal in 5 cases. In 1 the ulcer had perforated the posterior wall, the opening being blocked up by the pancreas. In another, ulcers were found all along the smaller curvature. In another, an ulcer of the size of a five-shilling piece had perforated near the pylorus, and here also the pancreas filled up the opening. In another, perforating ulcers existed in the anterior and posterior walls. The remaining case was that of a patient who had suffered from dysphagia nine months. Ulcers existed around the cardiac end of the stomach, and the trachea and œsophagus communicated by a large oval ulcerated opening.

All the cases of stricture of the œsophagus were believed to be the result of malignant disease.

31. *Intestinal Canal.*—In one case of obstruction, acute peritonitis supervened, and proved fatal. The other death was caused by a malignant growth producing the obstruction. Constipation was chiefly associated with dyspepsia. Three deaths are enumerated.

1 was a case of malignant disease of the rectum.
1 " " malignant disease of the stomach.
1 " " acute peritonitis.

In the deaths from diarrhœa, fever was the accompanying disease. One case of choleraic diarrhœa occurred on the 13th of June, in a man residing in Pimlico. In the three fatal cases of dysentery, immense ulceration and destruction of the mucous lining of the large intestines was found upon examination.

Five deaths are enumerated under ulceration.

1 was complicated with ovarian disease.
2 " " " dysentery.
1 " " " pleurisy and acute peritonitis.
1 " " " dropsy, albuminuria, and phlebitis.

No cases have been entered as "ulceration" of the stomach or intestinal canal, in which the fact was not ascertained by post-mortem examination; and those fatal cases are not enumerated in which ulceration was a symptom of fever or of phthisis.

32. *Peritoneum.*—Among the fatal cases, acute peritonitis was associated—

In 2 cases with malignant growths.

In 1 case with fever.
„ 1 „ ulcerated intestines and pleurisy.
„ 1 „ dropsy and disease of the heart.
„ 1 „ ulceration of the stomach.
„ 1 „ anasarca.

Chronic peritonitis was associated—
in 1 case with pleurisy and bronchitis.
in 1 „ tubercular deposit.
in 1 „ dropsy.

33. *Liver and Gall-bladder.*—One of the fatal cases of hepatitis was associated with dropsy and diseased heart; one with phthisis and chorea. Out of nine cases of cirrhosis, five had also ascites. In the remaining four, the disease was in an incipient state. Amongst the complicated cases of enlargement of the liver, four proved fatal;

1 was associated with diseased heart.
1 „ „ dropsy and albuminuria.
2 „ „ morbid growths.

The fatal case of jaundice was complicated with pleurisy. Inflammation of the liver, terminating in abscess, was found after death in three instances.

1 was a case of pneumonia and albuminuria.
1 „ phthisis.
1 „ extensive encephaloid disease.

34. *Spleen.*—Eight cases of *great* enlargement of this organ came under notice during the year; in six terminating fatally.

1 was associated with jaundice and pleuro-pneumonia.
1 „ „ disease of the heart and bronchitis.
1 „ „ fever and pyæmia.
1 „ „ phthisis and caries of temporal bone.
1 „ „ cirrhosis of liver.
1 „ „ dysentery.

35. *Urinary Organs.*—The fatal case of abscess of the kidney was associated with fever and pyæmia, and the spleen was of immense size. (See Div. 34.) Two cases of scrofulous abscess of the kidney also occurred.

The following complications existed amongst the cases of albuminuria:—

59 cases were complicated with dropsy.
24 „ „ „ disease of the heart.
29 „ „ „ disease of the lungs.
9 „ „ „ phthisis and scrofula.
4 „ „ „ diseases of the brain or paralysis.
6 „ „ „ rheumatism or gout.
1 „ „ „ diffuse cellular inflammation.
8 „ „ „ fever.
1 „ „ „ erysipelas.
9 „ „ „ disease of some other abdominal viscera.

One case of suppression occurred last year in a patient who had disease of the heart and albuminuria.

Cystitis was associated in one case with disease of the kidney. The

only case of diuresis was accompanied by Bright's disease; twelve to sixteen pints of urine were passed in the twenty-four hours; the specific gravity was always low, and the urine contained abundance of albumen, and exhibited casts under the microscope.

36. *Diabetes.*—An unusually large number of patients with this disease entered the hospital in 1855.

In 1851, five cases came under notice.
In 1852, three „ „ „
In 1853, five „ „ „
In 1854, four „ „ „
In 1855, eight „ „ „

37. *Ovaries.*—One death is enumerated amongst ovarian tumours. The patient was phthisical.

38. *Uterus.*—One case of puerperal fever, and one of puerperal mania, occurred in the ward appropriated to the obstetric physician.

Fifteen cases of amenorrhœa are enumerated, besides nineteen of chlorosis. The absence of anæmia is the reason for making a separate class, under the head of Uterine Affections. (See Remarks on Divisions 13 and 14.)

Besides fifteen cases of menorrhagia, twelve accidental cases of hæmorrhage occurred. (See Division 10, Hæmorrhages.)

39. *Bones and Joints.*—Three cases proved fatal.

1 was associated with phthisis.
1 „ „ scrofula and diseased heart.
1 „ „ paralysis and diseased kidney.

40. *Skin and Cellular Tissue.*—One fatal case of erythema occurred in a phthisical patient. An infant covered with eczema died shortly after admission. No organic disease was detected. Two deaths from cellular inflammation occurred—

1 in a case of paralysis and disease of the heart.
1 „ ulcerated bowels.

41. *Muscles.*—The rectus abdominis muscle was ruptured during tetanic convulsions. (See Remarks, Division 23.)

ART. IV.

On Infecting and Non-Infecting Syphilitic Sores. By HENRY LEE, Surgeon to King's College Hospital and to the Lock Hospital.

WHEN syphilitic matter is applied to the surface of the human body, no appreciable effect, in general, results; but when the poison comes in contact with the thin skin in those situations where it joins the mucous membrane, or when it is applied to the mucous membrane itself, or when applied to the skin in places where the epithelium has been removed, then inoculation may occur.*

When inoculation does take place, the nutrition of the inoculated spot is disturbed. Sometimes the part loses its vitality altogether; the part is

* The susceptibility to this inoculation varies very much in different individuals. A comparative immunity obtains in some persons, either from natural or artificial causes.

thrown off as a slough; the poison and the poisoned tissue together cease to exist. Sometimes the death of the infected part occurs much more slowly: it dies bit by bit, at longer or shorter intervals, or by a continuous action. The result is here generally the same as in the former case; but from the process being much longer continued, other morbid actions, followed by their natural consequences, are more liable to complicate the disease.

Instead of losing its vitality, the nutrition of the affected part may be so influenced, that although no part is thrown off as a slough visible to the naked eye, yet the poisoned tissue is unable to support its vitality. Ulceration takes place, and a loss of substance is the result: this is brought about partly by the action of the absorbents, partly by the breaking down of the tissues of the ill-nourished part, and the discharge of small portions of *débris*, mixed with fluid secretion. When the affected tissue is removed by the absorbents, the activity of the poison is not at once destroyed, as in case of the death of the structure to which it was first applied. Its presence may be clearly proved by its power of again inoculating the living tissues with which it comes in contact. This may happen at any point between the primary inoculation, and the first absorbent gland that the poison would naturally meet with, in its course towards the centre of the circulation. This morbid process will, in the following pages, be termed "ulceration," or "ulcerative inflammation." Again, the presence of the syphilitic poison may determine the formation of pus in the inoculated part. This action is usually preceded by the secretion of a thin serous fluid for a day or two; but as soon as the action is fully established, the secretion consists of pus globules and the fluid in which they float. This morbid action will be designated "suppuration," or "suppurative inflammation."

The more indolent and sluggish process by which lymph is separated, either directly or indirectly, from the blood in the inoculated part, will be termed "adhesion," or "adhesive inflammation."

The fibrin thus separated, if thrown off from the surface, may cease, like any other secretion, to be part of the living organization; but if infiltrated into the affected tissues, and not subsequently converted into pus, it will become permeated by vessels. It then undergoes the changes incident to the growth of other parts, and is finally taken up again into the venous blood.

Jenner,* in describing the effects of the vaccine virus, remarks that pustulous sores often appear spontaneously on the nipples of cows; and that instances have occurred, though very rarely, of the hands of the servant employed in milking being affected with sores in consequence. These pustules, he observes, are of a much milder nature than those which arise from that contagion which constitutes the true cow-pox. They are incapable of producing any specific effects on the human constitution, and are noticed lest a want of discrimination should lead to the idea that the persons affected were in any measure thereby secured from the infection of the small-pox. Jenner believed that the vaccine virus had its origin in a diseased secretion from horses' heels, and that this secretion is most active before it has acquired a pus-like appearance. "I am not confident,"

* Jenner on the Cow-Pox, ed. 1800, p. 7.

he says, "whether this property in the matter does not entirely cease as soon as it is secreted in the form of pus. I am inclined to think that it does."

Again, with regard to variolous matter, the same author says—

"Certain it is that this may undergo such a change from the putrefactive process, as well as from some of the more obscure and latent processes of nature, as will render it incapable of giving the small-pox in such a manner as to secure the human constitution from future infection, although we see, at the same time, it is capable of exciting a disease which bears so strong a resemblance to it, as to produce inflammation and matter in the incised skin, swelling of the axillary glands, general indisposition, and eruptions. This spurious action is often accompanied by more violent inflammation than that which occurs when the variolous matter produces its perfect effect upon the system."*

Willan also remarks, that if the vaccine fluid employed be taken at a late period, it does not always produce the genuine cellular vesicle, but is in some cases wholly inefficient; while in others it suddenly excites a pustule or ulceration, in others an irregular vesicle, and in others erysipelas. Similar appearances are occasionally observed when the lymph is taken at the proper time, and inoculated upon those whose systems are already under the influence of some disturbing cause. The variolous matter, improperly kept, or the thick matter taken from collapsed and scabbing vesicles when used for the purpose of inoculation, does not always produce the small-pox, nor prevent the future occurrence of that disease, although the persons inoculated may have had inflammation and suppuration of the arm and pains in the axilla, with fever and eruption.

Now as the inoculation of the vaccine matter may give rise to different kinds of inflammation which do not impart the natural action of the poison to the general system; and as the application of the variolous poison may produce various kinds of local action, which do not imply that it has infected the patient's constitution, so we find that the contact of syphilitic matter may give rise to different forms of local disease, which are not followed by any constitutional results.

A peculiar induration has been assumed by a large number of surgeons as the characteristic indication of such syphilitic sore, as will, under ordinary circumstances, infect the patient's system. M. Ricord, the principal advocate of this doctrine, is not, however, always quite consistent with himself. Writing in 1845, he says, the absence of induration of the base and edges of a chancre cannot be received as a negative proof; for the sores in which this characteristic does not exist, have both the contagious property of chancres, and the power of producing secondary symptoms.† At a subsequent period, M. Ricord, in his 'Lettres sur la Syphilis,' announces that the non-indurated sore never affects the patient's system, yet he admits that the presence of induration is liable to be deceptive, at least in other hands than his own. This diagnostic sign has not proved satisfactory to other surgeons. M. Cullerier, for instance, believes that the most simple chancre, with the least amount of local induration, may

* On Vaccine Inoculation (ed. 1804), pp. 31, 2.

† Les chancres privés de ce charactère ne conservent pas moins toutes leur propriétés; tant sous le rapport de la contagion que celui de la production des accidents consecutifs."—Traité de la Syphilis. Par J. Hunter. Annoté par Ricord, p. 425.

be followed by constitutional symptoms; while the late M. Vidal affirmed that all chancres were more or less indurated.

In England opinions have been as varied as in France. Thus, in the third edition of Mr. Langston Parker's work, where he speaks of the circumstances which particularly indicate the use of mercury in primary syphilis, the author includes "all sores which have yielded a characteristic pustule by inoculation." The indication for the employment of mercury, Mr. Parker says, is still more pressing if the primary sore be accompanied by bubo. (p. 15.) In support of this opinion, he quotes the following as from M. Ricord: "In such cases, six months never elapse without secondary symptoms manifesting themselves, unless a specific treatment be employed. This is an universal law which there is no means of eluding, but by mercurial treatment." These quotations profess to be taken from Stapleton's translation of Ricord. What M. Ricord himself, however, says, is exactly the reverse of this: "Tout bubon qui suppure spécifiquement, c'est à dire qui fournit du pus inoculable, n'est jamais suivi d'accident d'infection constitutionnelle."* M. Ricord's opinion, as here quoted from the original, is quite in accordance with the author's experience, and in direct opposition to the published views of Mr. Langston Parker.

The test by inoculation, again, is most fallacious as an indication of those sores which require to be treated by mercury. The genuine infecting sores commonly commence as a pimple, or crack, or a simple abrasion, from which there is little or no secretion; their progress is slow: they rarely become much inflamed, except artificially irritated, and they do not furnish a secretion of pus. It is often extremely difficult to inoculate such sores, and sometimes when they are inoculated, not a pustule, but a sore, showing the signs of the adhesive inflammation only, will result.

Case 1.—A medical student became diseased for the first time in the beginning of the present year. He inoculated himself on the thigh, and presented himself to me three or four days afterwards. The inoculation had succeeded, and became a small hard button-shaped sore, exactly resembling the original. A small quantity of white lymph was at first visible in the inoculation, but both sores subsequently remained as small hard circular indurations, furnishing scarcely any secretion from their surfaces.

Often such sores cannot be inoculated at all.

Case 2.—Matilda P., aged fifteen, was admitted into the Lock Hospital on the 9th of November, 1855. She stated that she had been diseased one week only. A well-marked indurated sore existed on the left external labium, secreting a thin fluid from its surface. Inoculation was carefully performed on the same day, with the discharge derived from this sore. The inoculation was followed with no result.

On the 23rd of November a copper-coloured eruption appeared on the body.

Case 3.—Julia B., aged twenty-one, was admitted into the Lock Hospital on the 10th of November, 1855. About three weeks previously

* Lettres sur la Syphilis, p. 199.

she had observed a pimple on the margin of the left external labium, which became a sore. On admission, this presented a circular outline, with a red glazed surface, and was surrounded by great induration.

November 12.—The secretion from the surface of the sore was inoculated upon the thigh.

November 15.—No result followed the inoculation.

CASE 4.—James G., aged twenty-five, was admitted into the Lock Hospital on the 25th of October, 1855. He then had a large indurated sore near the orifice of the prepuce, which had appeared as a pimple four weeks previously.

October 30.—Several inoculations were performed on the left thigh with the secretion from this sore, which was abundant.

November 1.—No result from the inoculations.

November 6.—Still no result from the inoculations. A well-marked syphilitic eruption has appeared upon the body.

CASE 5.—Thomas C., aged sixteen, was admitted on the 27th of November, 1855, with an extensive indurated sore extending halfway round the margin of the prepuce, causing phymosis. This had commenced a fortnight previously.

November 29.—The secretion from this sore was carefully inoculated on the patient's thigh in several points.

December 6.—No result had followed the inoculation. A copper-coloured eruption now made its appearance.

In none of the above cases had the sores apparently began to heal before the inoculations were performed. On the other hand, the readiness with which sores affording a copious puriform secretion are capable of being communicated by inoculation, is so well known that it would be superfluous to detail any examples. The inoculation of the puriform fluid on the same patient gives rise to a pustule, followed in general by a suppurating sore. The whole series of experiments on syphilisation lately performed on the Continent, show how rarely this kind of sore is followed by secondary symptoms. If, therefore, the production of a *pustule* by inoculation is to be regarded as of any value in determining whether or not mercury is to be given, it must be looked upon as evidence against the necessity of this mode of treatment, rather than for it.

The induration which accompanies syphilitic sores depends upon the effusion of lymph into the affected tissues, and the degree of induration depends upon the degree of effusion. The sense of touch affords a very correct test of the existence of this induration, but it does not give equally satisfactory information with regard to the character of the morbid action which may be taking place. It will not of itself always inform us whether the effused lymph will remain such until it be absorbed, or whether it will be converted into pus; whether, in fact, the inflammation be of the adhesive or the suppurative character.

The information which the degree of induration fails to give to the touch, the nature of the secretion examined by the microscope will often supply. The globules contained in the secretion of a sore accompanied by adhesive inflammation will often, it is true, at first sight, resemble those derived from a suppurating sore. But if the secretion, before being

examined, be treated with acetic acid, a clear distinction may be made between those cases in which the well known nuclei of the pus globules may be seen, and those in which they cannot.

This subject is illustrated by the following cases:

Case 6.—Emma H., aged eighteen, was admitted into the Lock Hospital with an indurated sore on the 14th of February, 1856. The disease had existed three weeks. Upon the addition of acetic acid to the secretion from this sore, no nuclei of pus globules could be seen. This patient was treated by mercury.

Case 7.—Anne H., aged twenty-four, was admitted into the Lock Hospital on the 13th of March, 1856. She stated that she had been ill three weeks, and had never been diseased before. An ulcer presented itself on the right external labium, with great general induration. Upon the addition of acetic acid the secretion from the sore presented, under the microscope, the distinct nuclei of pus globules. This patient was treated without mercury. The sore was healed on the 24th of March. Ten days afterwards, the induration was that of a common cicatrix only. On the 17th of April she was admitted, as permanently cured, into the Lock Asylum.

Case 8.—Ann S., aged twenty-four, admitted into the Lock Hospital January 17, 1856, with sores on the corresponding sides of the labia, surrounded by general induration. The secretion from these sores, examined under the microscope, consisted of numerous globules, of the size and general appearance of pus. After the addition of acetic acid, the distinctive characters of the pus globules became evident. The field of the microscope was studded with circular nuclei, one, two, or three of which occupied the position of each pus globule. This patient was treated without mercury, and left the hospital on the 24th of January.

Case 9.—Kezia K., aged twenty-two, had been repeatedly diseased, and had secondary eruption eighteen or nineteen months ago. She was admitted into the Lock Hospital with an indurated sore on the external labium on the 14th of February, 1856. The secretion from the sore afforded, upon the addition of acetic acid, numerous well-marked nuclei of pus. This patient was treated without mercury, and discharged cured on the 20th of March, the sore having healed on the 28th of February.

Case 10.—William D., aged eighteen, admitted on the 14th of February, 1856, with two ulcers on the skin of the penis. These, he stated, had commenced three weeks previously, and had discharged matter during the past week. Upon the addition of acetic acid to the secretion from these sores, numerous distinct nuclei, characteristic of pus, were left. Non-mercurial treatment.

Case 11.—W. O., aged nineteen, was admitted on the 12th of January, 1856. Had been previously diseased. At the time of admission an indurated sore existed on the prepuce, presenting to the eye all the appearances of an ordinary infecting Hunterian chancre.

January 17.—The secretion from the sore was scanty. Examined under the microscope, it showed a large number of very transparent cells, many of the same size, others of irregular size and form. Upon the

addition of acetic acid, no nuclei characteristic of pus globules were left. Treated by mercury.

CASE 12.—John E., aged twenty-two, admitted the 17th of January, 1856, with several indurated sores on the margin of the prepuce. On the addition of acetic acid to the secretion from these sores, no nuclei of pus globules remained. Treated with mercury.

Left the hospital, apparently cured, February 21st.

CASE 13.—Thomas C., aged nineteen, admitted with an indurated sore on the 17th of January, 1856, accompanied by an enlarged, but not inflamed, gland in the groin. Upon the addition of acetic acid to the secretion from the sore, no nuclei characteristic of pus were left. Treated by mercury.

CASE 14.—Samuel L., aged twenty-one, was admitted on the 4th of February, 1856. Had been previously diseased. On admission he had phymosis from indurated sores and gonorrhœa. When the prepuce could be sufficiently retracted, the discharge from the sore, and from the urethra, were both examined under the microscope, after the addition of acetic acid. The secretion from the urethra showed abundance of globules in which the nuclei characteristic of pus were visible; that from the sore showed no such appearance.

CASE 15.—John G., aged thirty, admitted the 28th of February, 1854, with a superficial indurated sore on margin of prepuce. The secretion from this sore, examined by the microscope, afforded no nuclei characteristic of pus after the addition of acetic acid.

March 18.—Brown stains appeared upon the nates. Treated with mercury.

CASE 16.—G. M., aged eighteen, admitted the 28th of February, with indurated sores on the margin of prepuce. The secretion from these sores showed no characteristic nuclei on the addition of acetic acid. Treated with mercury.

The following is a table of cases in which the secretion from syphilitic sores was determined by microscopical examination, in the manner above mentioned, to be purulent. The observations were made almost exclusively in cases of men, and where there was no apparent possibility of any other secretion becoming mixed with that from the sores. They extended over a period of eight months, ending in July, 1856. The 37 cases contained in the table were carefully registered from hospital practice. They were all treated, as a rule, without mercury; and in none of them were any secondary symptoms known to have followed. To these might be added a large number of suppurating primary sores, which have come under the author's notice during the last three years, which were treated without mercury, and in which no secondary symptoms showed themselves; but as the nature of the secretion from the primary sores in these cases was not examined by the microscope after the addition of acetic acid, the details are omitted.

The conclusion to which our cases and observations point is, that as the syphilitic poison may be, and generally is, destroyed by mortification

of the part in which it is contained, or as the same result may be produced by suppuration in an absorbent gland, consequent upon ulcerative inflammation; so may the deciduous cell-growth, or suppuration on the surface of a poisoned wound effectually eliminate the poison from the part.

Table of Cases of Suppurating Primary Syphilitic Sores.

Name.	Age.	Description of primary affection.	Treatment.	Result.	Remarks.
G. E.	26	Ulcer on prepuce	Tonic	Healed in 12 days	Accompanied by suppurating bubo.
J. B.	18	Ditto	Ditto	....	Ditto.
W. B.	30	Sore on frænum	Local	Cured in 4 weeks	
H. M.	17	Sore	Ditto	Cured in 1 month	Abundance of pus globules in secretion.
J. B.	20	Sore, surrounded by induration	Tonic	Cured in 3 weeks	Nucleoli observed to be very distinct.
J. D.	30	Concealed sores	Ditto	Ditto	Accompanied by bubo.
R. S.	23	Ulcer on base of glans	Local	Cured in 1 month	Suppurating bubo.
W. S.	31	Ulcer on penis ...	Ditto	Cured.	
J. D.	21	Concealed sores	Mercurial, for a week only	Cured in 4 weeks	Accompanied by bubo.
J. F.	24	Superficial ulcer	Local	Cured.	
H. W.	20	Sore	Tonic	Ditto.	
J. S.	23	Sore on frænum	Local	Ditto	Inflamed gland, which did not suppurate.
C. T.	26	Ulcer on prepuce	Ditto	Ditto.	
C. M. C	22	Sores, accompanied by induration	Ditto	Ditto	Induration had no specific character.
F. W.	24	Sore on frænum	Ditto	Ditto	Pus globules abundant.
C. F.	20	Ulcer on frænum	Mercurial, for orchitis	Ditto.	
E. C.	23	Superficial sore	Tonic	Cured in 14 days.	
A. S.	24	Ulceration, surrounded by general induration	Ditto	Left the hospital nearly well.	
K. K.	22	Indurated sores	Iodine and sarsaparilla	Cured in 5 weeks	Had previously had constitutional disease.
A. H.	24	Sore, accompanied by induration	Tonic	Cured in 5 weeks	Pus globules abundant.
J. S.	21	Superficial ulcer	None	....	Slight case.
A. B.	20	Primary ulcers	Tonic ..	Cured in 3 weeks.	
G. D.	23	Primary ulcer, with slight induration	Mercurial, for four days	Cured in 6 weeks.	
H. S.	20	Unindurated sore	Saline......	Cured in 14 days...	Open bubo.
G. F.	21	Primary sores ...	Tonic	Left nearly well ...	Bubo.
J. H.	18	Primary sore, accompanied by slight induration	Ditto	Cured in 8 weeks.	
G. C.	30	Sore on prepuce	Local	Cured in 3 weeks	Bubo in left groin.
C. L.	22	Concealed sores	Tonic	Ditto.	
J. R.	17	Phymosis and sores	....	Cured.	
J. J.	30	....	....	Supposed to be cured.	
R. P.	18	....	....	Ditto	First disease.
R. W.	22	Sore, surrounded by some induration	A few mercurial pills for orchitis	Ditto.	
R. J.	15	Superficial sores under prepuce	Simple ...	Ditto.	
J. B.	...	Primary sores ...	Ditto	Ditto.	
W. S.	24	Several small pustules, surrounded by considerable induration	Local	Ditto	Enlarged glands in both groins.
G. H.	27	Sores of seven weeks' duration	Ditto	Ditto.	
W. A.	...	Sores of two weeks' duration	Ditto	Ditto.	

PART FOURTH.

Chronicle of Medical Science.

HALF-YEARLY REPORT ON MICROLOGY.

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PART I.—PHYSIOLOGICAL MICROLOGY.

CELLS—EPITHELIUM, PIGMENT, ETC.

*Epithelium.**—The epithelial cells of the conjunctiva were examined by Krause in the body of a criminal just beheaded, and found by him to be entirely of the pavement variety. None were ciliated. Those of the ependyma of the third, fifth, and lateral ventricles of the brain were also of the pavement form.

Phenomena in the Life of Pigment-Cells.—Busch† has made a series of highly interesting observations upon the various changes which take place in the pigment-cells of the skin. His attention seems to have been first drawn to this subject by portions of coloured skin separated from the larva of the frog and the triton, and by the web of the frog's foot. He found that often the cells put out projections from their walls, which went to form pigment-globules or balls, and as these projections lengthened, these globules became, as it were, pedunculated. The stalk then gradually thinned, and finally altogether retracted, leaving the pigment-globules isolated. The process was repeated in the same cell, and was a second time watched. Sometimes a species of sac was pushed out, which became divided into two, and after increasing greatly, became disjoined from the main pigment-cell, and another one was then pushed out in its place. Changes of form in the pigment-cell and in the peduncles were also observed, and are figured by the author. Busch also found the pigment-cells to be very contractile, and responsive to the stimulus of electricity.

Contractility of Animal Cells.—Busch, in the same paper as the one alluded to immediately above, describes the effect of electricity, which he applied to various cells besides the pigment-cells alluded to. He found that decided contractility was produced by it in the blood-cells of amphibia and in the various forms of recent epithelium-cells; but in cells with much granular contents, or which had undergone any fatty alteration, this effect did not follow the application of electricity.

MUSCLE, TENDONS, ETC.

On the Connexion between Muscular Fibre and Tendons.—Fick‡ details at length many observations on this point, his observations being chiefly made on the muscles of the frog. The condensed results of his examinations may be arranged as follows:—1st. The connexion between muscular fibre and tendon is the same in all

* Henle and Pfeuffer's Zeitschrift, Band vi. Heft 2. 1855.
† Müller's Archiv, No. 4, 1856, p. 415. ‡ Ibid., p. 425.

the muscles of the same animal, and, as a general rule, in various animals. 2ndly. Each muscular fibre has a certain bundle of tendinous fibres connected with it. 3rdly. The bundle of tendinous fibres is always of a smaller diameter than the muscular fibre belonging to it. 4thly. The flask-like projected tendinous bundle is invested by its muscular fibre as a sarcolemma. 5thly. Besides the flask-like investment, other inner threads of the tendinous bundle are connected with the appertaining muscular fibres, which probably extend themselves to a certain extent between the fibrils of the muscular fibre.

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6. ARTICULATIONS.

On the Development of Joints. By Luschka.—The author, from observation, having determined that the pubic articulation was the lowest step in the formation of an articulation, conjectures that it might possibly represent a certain stage of development in other joints. Having found in the human and other fœtus, that a fibrous substance enveloped the articulating cartilage, and moreover that, in the cartilage of the pubic joints, such a material was spread over its hyaline foundation (*grund-masse*), and afterwards that variously-formed small microscopical projections were formed which, along with their substratum, passed into a fluid synovium; and that, finally, a cavity bounded by smooth cartilage was produced, he thought that this might be the ordinary process in the formation of all joints. He took for examination the union between the second and the seventh and intervening ribs with the sternum, and also that between the manubrium and the body of the sternum. In the above-mentioned cases, the union in early life is often by a species of continuity, and effected by means of a fibrous substance instead of by a proper articulation, which becomes lost in the cartilage-mass covering the costal sinus in the edge of the sternum. When a very small cavity exists, the cartilage of the rib and the sternum is covered with an extensive fibrillation, and exhibits on the surface turned towards the cavity, a very uneven appearance, owing to the projection of the fibre bundles undergoing destruction, the whole of the elements in the neighbourhood of the cavity indicating a gradual and progressive process of dissolution. The substance covering the cartilage is not thoroughly dissolved, as a rule, in the development of the sterno-costal joints, since in grown-up people, almost universally, at the rib-cartilage exists a layer, at one time homogeneous, at another time more striped, from which variously-formed leaf-like or branched projections are wont to grow into the cavity. That which, between the ends of the second and seventh, and included cartilages, and the sternum, exists as an exception—namely, the continuity by means of a fibrous substance—exists as a rule in the union between the body and the manubrium of the sternum. Here the union—unless it be, as it often is after the age of forty, bony—consists, almost without exception, of a fibrous substance which joins both the discs, consisting of pure cartilage. The fibrillation proceeds from the mass of the discs, without any line of demarcation, and contains, besides a number of cartilage cells, a very large amount of firm elastic fibre. The fibrous mass generally, in the instance of the second rib, is united with the angle dividing the cartilage into two facettes. Only in very rare cases is there any cavity between the manubrium and the body of the sternum. One case (a child aged two years, and also two adults) showed this. In the former the cavity was of the size of a lentil, and in the latter, of a coffee-bean—the inner surface not being smooth, but beset with leaf-like and fibrous projections growing from the sides, and sometimes almost filling the cavity. In these cases, the cavity is formed by liquidation of the originally solid connective substance, and thus the outgrowth of the remaining tissue takes place in the form of processes. Similar attempts in the formation of a joint are to be seen in what are termed "false" joints, where the connective material between broken fragments of bone, at first solid and fibrous, undergoes solution, and the formation of a thin

* Virchow's Archiv, No. 5, 1855, Heft v. p. 481.

capsule takes place; the synovia-like mass being seen to escape at times under operations. The lower-jaw articulation illustrates the normal maintenance of an earlier developmental stage. The thick elastic fibre-holding material overlying the cartilage substance, generally has a number of fine projections, which, although mainly projecting into the cavity, yet is at times partly grown together with the tissue of the meniscus. Similar illustrations are obtained in examining the connexion of the ribs with the vertebræ. Over a layer of hyaline cartilage at the head of the rib, and corresponding tubercle of the rib, exists a layer of fibre substance, gradually springing from the substructure, and exhibiting in the layer nearest to it a peculiarly-formed branching trabecular-fibrous work, giving off forked fibres of various thickness, and finally terminating in pencil-like projections. Round spaces are thus enclosed by the mesh-work; and in the trabecular fibres, as well as in the structureless areolar tissue filling the spaces here and there, cartilage cells and elastic fibres are visible. The fine fibres radiate into the connective tissue towards the surface of the cartilage, which contains only a few cartilage cells, but many elastic fibres. With exception of the above-mentioned joints—namely, of the ribs, the sterno-costal and maxillary joints—in adults and in the natural condition there exists over the cartilages, either no material differing from their own, or only one of extreme tenuity, and free from elementary forms. Quite different is it with the fœtus and newly-born. In these cases, over the cartilages there exists a substance, sometimes fibrous, sometimes homogeneous, or only slightly striped, which proceeds from the substructure so entirely without demarcation, that it may without hesitation be considered as belonging to it, and only resulting from the development of the joint. What chiefly appears, and one of the best instances exists in the joints of the toes in the newly-born, is the variously-formed outgrowths from the surface, in great numbers. In the cartilage of the hip, knee, and shoulder-joints, and others also, they are more scanty. The most ordinary form is the foliaceous. Along with the single projections, bush-like and branching forms also exist, which, like the substance from which they grow, are at one time structureless or finely striped, at others fibrillated and twisted, behaving like ordinary areolar tissue under reagents. In some are to be seen elastic fibres and cartilage cells. Those cases showing only traces of the projections, are specially interesting as giving an insight into the formation of synovia by solution of the tissues and the smoothening of the cartilage in a complete joint.

SECRETING GLANDS.

Kidney.—Busch* has made a communication on the anatomy of the kidney. After alluding to the investigations of Goodsir and Müller regarding the formation of secretion in cells, which burst and allow its outflow, he specially mentions the discovery by Müller, of the formation of secretion vesicles containing clear fluid and uric acid salts in the interior of the cells, which grow and occupy the whole cell eventually, and finally the granules of salts are liberated into the excretory ducts. The snail is particularly referred to. Müller concluded that only the secretion vesicles were excluded, and new ones formed by the cells. The author had observed granules of uric acid salts also between the secretion vesicle and the cell wall, and some cells also with these granules and no secretion vesicles. Hence the latter are not necessary for the filling of the cells with urinary precipitates. In almost all cases the first amorphous granular urinary material, forms before the vesicle, whose walls are formed out of the cell-contents round the partially precipitated urine. The author enters at length into the discussion regarding the chemical character of the urinary deposit, whether it be a simple acid, or a salt, and what salt; and also regarding the proof that the urine is not brought to the kidneys as a salt, and soluble, but that the cells of the gland produce it by a chemical process out of the material brought to them. He goes on to speak of

* Virchow's Archiv, Band iv. 1855, p. 363.

the different views of the relation between the Malpighian bodies and the urinary tubes, and determines, by his observations on snakes, that they are decidedly enclosed in a capsule, being the enlarged termination of the urinary canals. The snake has the Malpighian body quite at the termination, whilst the triton only has it in a wider part of the canal; and in the snake ciliated epithelium exists at the margin, uniting the body to the tube just as Bowman described in the frog. The chief part of the wall of the capsule is lined by a polygonal epithelium, and on the free surface of the knot of vessels inside the capsule a distinct epithelium may be seen in fortunate cases, which in the embryo of the cellular matrix may occasionally be witnessed crossing bridge-like from one convolution of the vessels to another; but no connective tissue was visible between the cells and the vessels. The vessels seem to pierce the capsule, carrying a layer of epithelium before them. In general, the Malpighian vessels in the lower animals are merely windings of the same vessel, but in some, as in the viper, divisions and ramifications of the vessel existed. At least, in the kidneys of snakes the ciliated epithelium is seen entering low down the tubes, provided that water is not used in the preparation. Each cell is seen, when the movement becomes slow, to have only one cilium, which moves about like a whip-lash. Ciliary movement could not be seen in the kidneys of birds.

VASCULAR GLANDS.

The Spleen.—C. O. Eberhard* considers the function and structure of the spleen in an inaugural dissertation at Erlangen. He considers especially the relation of the Malpighian bodies to the lymph vessels. According to him, the arterial twigs do not lose themselves in the corpuscle, but the union between them consists merely in that of the areolar tissue of their investment and the sheaths of the vessel. Each corpuscle is limited by a colourless investment of a double contour, formed of areolar tissue, with indistinct fibrillation, containing also a fine network and tolerably straight-running elastic fibres. The contents are whitish and albumen-like, showing the same microscopical formation as the surrounding spleen pulp; and the parenchyma of the corpuscle is penetrated by a fine network of capillaries entering from outside, though not directly arising from the arterial twig. These capillaries have very thin walls, so that an injection by the splenic artery often fills the corpuscles. The author then alludes to the similarity between the Malpighian corpuscles and the solitary and Peyer's glands of the intestine, and the connexion, which Brücke has proved by injection, between the lymphatic and Peyer's glands. Yet, it is not possible by direct injection of the deep lymphatics of the spleen to fill the corpuscles. In injecting from the artery we very often get not only the corpuscles filled with extravasation, but it also finds its way into surrounding vessels, where projections show them to be lymphatics. Sometimes, too, lymphatic vessels are to be seen departing from a Malpighian body, in opposition to the opinion of Kölliker, who looks on the Malpighian corpuscle of the spleen as a peculiar form of simple terminal lymph-gland. Hence we have direct proof of the communication between the deep splenic lymphatics and the Malpighian corpuscle; and this view receives support from the fact that similar connexion exists in fishes and reptiles. The author then alludes to experiments in proof, made by the removal of the spleen during life, and others, and the results obtained, which may be summed up as follows:—1. The rapid deposit of pigment in mesenteric glands. 2. The regeneration of the spleen in frogs after extirpation; the more interesting, as in frogs lymphatic glands are wanting. 3. That fluid introduced into the stomach entered the liver more quickly than the spleen, and that the time of entering the spleen was the same as in the case of the mesenteric glands.

* Quoted in the Vierteljahrsschrift für Pract. Med., Band iii. p. 82. 1856.

NERVOUS SYSTEM.

On the Reparation of Divided Nerves.—Lent* found that on dividing nerves in animals, the divided portions at both ends showed an increase of the nuclei of the neurilemma, probably arising by division of the normal nuclei. Out of these nuclei proceed most likely new cells, and from these, fibres, establishing a communication between the ends of the nerves. After the union, new nerve-marrow forms in the nerve-sheaths of the primitive fibres of the peripheric part of the nerves, which had been emptied by the section; but the author could not clearly discern any axis-cylinder in these parts, which Schiff asserts can be seen after placing the preparation for several hours in a solution of bichloride of mercury, and then adding acetic acid.

Papillæ.—The papillæ at the tip of the tongue in a criminal beheaded, presented no tactile bodies.†

PART II.—PATHOLOGICAL MICROLOGY.

TUMOURS, MORBID DEPOSITS, EXCRESCENCES, CYSTS, ETC.

Cancerous Deposits.—S. Van der Kolk‡ has a long paper On the Extension of Cancer-Cells to the Neighbourhood of Cancerous Tumours, and its Pathological Consequences. He details his observations on the method of propagation of carcinoma, and for the greater convenience of accurate examination, paid attention to cancer of the lower lip. He says that, having amputated the lip affected with epithelial cancer, he cuts it in a longitudinal direction, so as to have an anterior and a posterior portion, and finds that the lesion extends more in length than depth. On making a fine section parallel to the original one, the tumour will be found to consist of an aggregation of epithelial cells, which are of smaller size in proportion to the distance from the margin of the tumour. On examining the adjacent parts, which to the eye appear healthy, one finds numbers of small cells or nuclei, and finally a granular substance, with molecules of fat among the healthy tissues, in abundance proportionate to the distance from the cancer growth. The extension exists chiefly under the epidermis. One may often trace the passage of nuclei, around which a cellule is hardly formed into complete epithelial cellules. The transformation of granular substance and nuclei into cellules is seen on examining further. The nuclei and cellules are seen to be spread among the fibrous tissue, between the muscular fibres, and some along the muscular fibres themselves. In other cases, nothing but a granular substance and nuclei, in their first stage of development, mixed with fat, are to be seen. The muscular fibres, even where quite covered with nuclei and small cellules, showed their proper structure when cleared. In some places, the transverse striæ were effaced, and a degeneration existed with a kind of dissolution of muscular fibres, which appeared to be resolved into cellules. When the muscular fibres were surrounded by sufficient nuclei to be observed, the fat globules diminished in number, as if repelled by cellules and nuclei in the intermediate tissue. The nerves made great resistance to this degeneration. In some places one found the nervous fasciculi surrounded by epithelial cells, without the least trace of decomposition inside the neurilemma. It is only exceptionally that there exist between the nervous fibres, any nuclei or small cellules. A large proportion of cellules and nuclei occupy the follicles and crypts of the chin, from which the constituent parts had been successively removed after having probably undergone the fatty degeneration and dissolution.

It appears certain that an exchange takes place between the epithelial cellules and the interstitial liquid. The fluid receives from the cellules new principles, which do not exist in the fluid of healthy parts; and the two fluids—that between

* Zeitschrift für Wissench. Zoologie: quoted in Canstatt's Jahresbericht, p. 32. 1855.

† Henle and Pfeuffer's Zeitschrift, Band vi. Heft 2.

‡ Arch. Générales, Jan. 1856: quoted from Henle and Pfeuffer's Zeitschr., Band v. p. 127.

the cellules and that between the healthy parts—appear to become more or less mixed, and thus the liquid penetrates along the course of the fibrous tissue; and it is there that the nuclei and cells of new formation are deposited, and spread to places more distant." The author then goes on to mention cases in which the examination of portions of the surface after extirpation of the lip, confirmed the prognosis made by him. The altered fluid not only infiltrates the tissues, but may be absorbed by lymphatic vessels, and so transplant the malady; and this is the case with epithelial as well as cancers, properly so called.

The author alludes to similar cases mentioned by Donders, Bennett, Lebert, and Hannover, and supposes that the altered and absorbed parenchymatous fluid generates the epithelial cellules within it, not by the transport of cellules ready formed, but by reason of a chemical modification in its constituent elements. In fact, the cancer cellules may be produced inside the sarcolemma of muscular fibre, which could not give passage to a single nucleus. He mentions also a case of epithelial cancer of the tongue, wherein the root of the tongue was affected, and in which a large ulcerated tumour existed in the neck, which presented the characteristics, not of epithelial cancer, but of ordinary cancer, proving the position denied by Hannover and Lebert, but entertained by Bennett and Schrant, who admit the metamorphosis of one form of cancer into another. The author regards ordinary and medullary cancer as only the acute form of epithelioma, and asserts that the parenchymatous fluid acts in the same way in these cases as in epithelioma. He adduces cases which we cannot detail here. In one of them, besides the muscular fibres being transformed into fibrous cells, more or less long and numerous, the tibial nerve was greatly altered, the primitive nerve fibres being atrophied where the nerve appeared to be transformed into a fibrous tissue, mixed with cellules and molecules of fat. The cancer cells may penetrate the walls of veins, and, though rarely, of arteries. In two cases of medullary cancer of the liver, in a part of the tumour developed in the portal vein adjacent—which is often the seat of medullary cancer—the capillaries of this part, enclosed in the cavity of the vein, were injected a fine red colour through the arteries. In those cases in which the fungus has penetrated the mucous walls, no membrane of any kind was seen to envelope it, or separate it from the blood's current. In the propagation of cancer by the fluid before alluded to, very often many nuclei are developed in a single cellule, which breaks and allows of their escape; but this latter formation never takes place in epithelioma. As regards the implication of nerves, the author then mentions a case of extensive cancer of one-half of the tongue, in which he examined the lingual and hypoglossal nerves of the other side, neither of which showed the presence of any tubules within them; yet on removing a very small portion from the middle of the hypoglossal nerve, cancer cells were seen. A nerve which will resist surrounding suppuration will be apparently occupied by cancer; and the author thinks that the extreme pain so often felt in parts attacked by cancer, is the result of the deposition of cellules within the nerves, and that the time for operation is probably passed when this occurs. He proceeds to counsel the immediate extirpation of any tumour or induration which might give rise to cancer; as, when once the cancer is formed, the cellules increase very rapidly in size and number, and are no longer separated from surrounding parts by a thick fibrous layer, the mass softens, being entirely composed of cells, and is past the relief of any operation.

On Scrofulous Deposit.—Küss* considers that pulmonary tubercle, so called, only consists in the heaping together of epithelial cells in the various vesicles of the lungs, and that all its metamorphoses arise from their destruction. In this way, he asserts that tubercle in the various glands, the intestinal mucous membrane, and the medulla of bone, &c., is easily to be explained as arising from the globules existing therein. Thus, according to him, tubercle is not a foreign heteromorphous material, but simply the results of proliferous cell elements. By Mandl†

* Canstatt's Jahresbericht, 1855, p. 89: from Gaz. Méd. de Strasbourg, Août 25, 1855.
† Archives Générales de Med., Avril, 1855.

scrofulous deposit is considered to be a crude mass, only exhibiting corpuscular and other arrangement as the result of the method in which it is torn up. He determines that it has no specific histological character, and that the fatty and shrivelled elements of reticulated cancer, and many other products, are to be compared exactly to tubercle corpuscles. According to Engel,* tubercle at first consists of an amorphous exudation, in which cells are formed at a later period, which gradually undergoes a fatty or calcareous change, and softens.

Pathology of Lupus.—K. H. Mohs,† in a Dissertation published at Leipsic, describes this affection as consisting of a true hypertrophy of the cutis, and ranks it amongst the so-called sarcomatous formations. The hypertrophy seems to arise from the division of the normal cutis cells, and not from a free and independent cell-formation. The author examined with the microscope a perfectly recent portion of tuberculous lupus of the face. The cutis was thickened and transparent, and of the consistence of fine glue. In the subcutaneous fatty tissue, some knot-like places existed, of the same character as the substance occupying the corium. The epidermis was thin. The peripheric part of the diseased places was tuberous, beset with hair, the middle portion being smooth and devoid of hair. The minute examination of the diseased tissue showed a granulated mass, beset with trabeculated areolar tissue-material, containing nuclei, round and oblong, and spindle and biscuit-shaped, and of a yellow colour, with one or more nucleoli, and having an intervening, transparent, hyaline, slightly-granulated material; and the knotted parts in the fatty tissue before spoken of had the same microscopical characters as the general mass. Moreover, the latter tissue was occupied by much connective tissue, having an areolar arrangement, and containing capillaries but no nerves. The papillæ in the peripheric parts were normal or slightly enlarged, but in the central parts they were in small numbers of various sizes, flattened or lobate, and containing one or more vascular loops. The hair and the skin follicles in the peripheric parts were normal; but towards the central parts, elongated bodies, corresponding to the hair follicles, and consisting of united group-like epidermis cells, existed. No follicles existed in the middle portions. On tearing up the fibrous tissue, irregular masses were observed, of a clear granular material—so clear indeed in outline, that they were to be looked upon as cells of a round, oval, or spindle shape, and mostly of about half the size of epidermis cells, being probably formative cells of areolar tissue. Similar appearances were observed in an ulcerated lupus, but in the latter case the nuclei were larger and more numerous, and the areolar tissue fibres more scarce.

Spermatic Cyst, with Hæmatocele.—M. Chassaignac‡ relates a case, in the person of a man, aged sixty-nine, who came into the Hôpital Lariboisière with a tumour of seven or eight years' standing at the right side of the scrotum, for which no cause could be assigned. Its greatest diameter was twenty-two centimètres; it was elongated vertically, and largest at the lower part; its consistence being that of a hydrocele moderately distended. The position of the testicle could not be ascertained. The upper part of the tumour was close to, but distinct from, the external inguinal ring, and the skin of the penis was drawn up, helping to form the covering of the tumour. On puncturing the tumour, a quantity of reddish fluid escaped, becoming frothy on agitation, but containing no clots. The fluid yielded a very abundant precipitate. On the addition of nitric acid and alcohol, and the application of heat, it exhibited, when examined by the microscope, a very large number of spermatozoids, perfectly developed, but not in motion. Large numbers of spermatic vesicles, but less in number than the spermatozoids, also existed; and also a certain number of more or less attenuated blood corpuscles. Some of the fluid agitated with a few drops of oil, assumed a cloudy grey colour, from the formation of an emulsion. This was done with reference to the view of M. Gos-

* Prager Vierteljahrsschrift, Buch, 1855, Band xii. p. 1.
† Schmidt's Jahrbücher, No. 8, 1856, p. 406. ‡ Gazette des Hôpitaux, Juillet 8, 1856.

selin,* who supposes that the milk-like character of the fluid often seen in such cysts, was owing to the emulsive power of the sperm acting on the fatty matter secreted by the cyst. The testicle was, in the above case, found to be quite healthy, the cord only being a little enlarged. The author believes the tumour was the largest of the kind known, and deems it peculiar, as simulating hydrocele of the tunica vaginalis. We lately had the opportunity of witnessing the fluid removed from a similar cyst by Professor Hewett, of St. George's Hospital, containing similar spermatozoids.

6. SECRETING GLANDS.

On the Kidney.—Becquerel† treats upon the form of disease named after Bright. He describes the affection as embracing four different varieties, thus summed up:—1. Hyperæmia of the cortical parts and Malpighian bodies, and often with exudation of albumen or blood into the urinary tubes. 2. Fatty degeneration of the urinary epithelium, the cells being finally destroyed, and the empty canals collapsed or filled with fibrinous exudation. This fatty exudation may also take place into the tissue between the urinary canals, with or without albumen. 3. Albumino-fibrinous deposits, in streaks or masses, forming the so-called granulations, and existing in the urinary canals, Malpighian bodies, or intervening tissue, and capable of organization. 4. Infiltration of the urinary cells with protein molecules, and enlargement of the cells which fill out the urinary canals.

All the above forms may be, according to the author, isolated or combined.

VASCULAR GLANDS.

On the Spleen.—Förster‡ found hypertrophic growth of the Malpighian bodies in one instance of great enlargement of the spleen. The viscus was also very indurated, and beset with round white knots, which were situated partly in the deep parts, and partly at the periphery. Each of these knots was composed of a number of smaller ones. Besides these knots, others, isolated, and equal in size to a hemp seed, were seen. These proved to be Malpighian corpuscles. By increase of the normal cells and of the vascular scaffolding, the corpuscles increased to the size of a hemp seed. Thus the mass grew in a lateral direction, and there arose small irregular and almost dendritic formations, consisting of cells of the corpuscles and capillaries. The larger knots, formed by the grouping together of many such, were partly soft and partly hard and dry, by atrophy and cheesy alteration.

Führer, whose observations on the Anatomy of the Spleen we gave at p. 529 of No. xxxii., October, 1855, in a late communication to the Dutch Medical Society at Paris, determines four general diseased conditions of the spleen. 1st. The plethoric form, in which the microscope showed the Malpighian bodies to be highly developed, the organ being dark, granular, and large. 2nd. The puerperal spleen, compact, and of large circumference. 3rd. The chlorotic spleen, containing numerous gelatine-like transparent corpuscles, of a light red colour, and large. And 4th. The atrophic spleen of the aged and emaciated.

On Fœtal Glandular Tissue in Tumours of the Thyroid Gland.—Billroth§ describes at length the above-named condition. After alluding to the natural form of development of the thyroid gland, specially examined by Remak, but confirmed by his own observations, he applies the results of observations on this point to its pathological anatomy. In detailing the development of the thyroid gland, he describes the single vesicles as arising from cell-composing cylinders,

* Gazette des Hôp., Août, 1855. † L'Union Médicale, Mai, 1855.
‡ Canstatt's Jahresbericht, 1855, p. 43. § Müller's Archiv, 1856, Nos. 1 & 2, p. 144.

arranged in a radial direction. The cell-layer composing the wall of the single vesicle thickens, forms clavate processes, in which is developed a hollow space, and the process separates itself as a new vesicle. The formation of the hollow space in the process seems to be often unconnected with that of the original vesicle. The author details a case of a large thyroid tumour in a woman, aged sixty-seven, punctured during life, and removed after death. The fluid evacuated during life showed, under the microscope, molecular matter, fatty granules, granular pigment, but no pigment crystals. A quantity of flocculent material also escaped, consisting partly of amorphous clumps of destroyed tissue, and partly showing the same appearances as the general mass when cut into. The mass of the tumour was elastic, its colour being yellowish white, but it contained small dark apoplectic-like spots, and on section gave out a thick whitish granular material containing variously-shaped cells, some being homogeneous, some being finely granular and fatty, and many nucleated, increasing by division; others were without nuclei. By far the chief part was composed of large globules and cylinders, consisting of cells, and containing a hollow space. The peripheric layer of these cylinders and globules was composed of cylindrical cells. The tumour was evidently not one of ordinary hypertrophy of the thyroid gland, but made up of a peculiar tissue, which had many analogies with cystoid of the kidneys, and so called cysto-sarcoma of the mammary gland. Nothing could be gathered from the small part of sound gland remaining on the affected side of the neck, showing how the embryonal textural elements formed themselves out of normal follicles. The foundation of the embryonal glandular pouches and vesicles was laid down in solid club-shaped bodies, consisting of cells and sprout-like processes, into which the cavity extended, in part arising from the canal of the mother tissue, and partly arising alone and isolated. These processes were often very small, and might consist of a row of cells lying one behind the other, to which was connected a vesicle made up of a circle of cells. In the spaces no longer filled with cells, a fluid or slimy homogeneous substance existed, arising either from the dissolution of the central cells, or by a kind of secreting activity of the cells. Along with this increase of the gland-elements by sprouts, they also increased by the excessive growth of the parietal cells of the glandular vesicles; and before an outgrowth was produced in the centre of this cell-mass, a new hollow space was formed. These embryonic elements, as in the case of gland tumours generally, did not attain their full development, but only certain steps, and these underwent fatty or colloid changes, large pale globules with an irregular cavity, like colloid globules, being formed, undergoing dissolution, and corresponding to an association of cells in glandular vesicles.

RESPIRATORY ORGANS.

The Lungs.—The subject of induration of the lungs, and consequent changes in the bloodvessels, has been commented upon at length by Heschl, of Krakow.* The instances of simple induration were chiefly in the bodies of those who were enfeebled by long-continued disease of the liver, spleen, or kidneys; but it was difficult to make out whether it resulted from the disease. He adverts to the observations of Rokitansky, who denies that the change is owing to chronic inflammation, although he does not prove its absence—and of Förster, who asserts, but does not prove, its existence. He quotes at length three cases. In the first, a man, aged nineteen, who died of dropsy and ague, the solidified parts of the lung, besides infiltration of the pulmonary vessels, with exudation matter and pus corpuscles, showed a large amount of fatty degeneration of the alveolar epithelium. In the pus-like fluid expressed from it were numbers of granules and pus-cells, connected by a molecular material; but besides these there existed granule-cells, with one or two projections and wedge-shaped, rounded, and spindle-shaped cells, like those of areolar tissue, and also pus and blood-globules. More-

* Vierteljahrsschrift für die Praktische Heilkunde, 1856, Band iii. p. 1.

over there were large roundish globules of a hyaline substance, beset with fat granules and granule-cells; gradually soluble in caustic alkali. In sections of the lung the trabecular work was found to be two or three times thicker than usual, and appeared to consist entirely of connective tissue in various stages of development; and at the margins of the alveoli, corpuscles with nuclei were seen projecting; looking at first like epithelium. The ends of the trabecular work were also found to consist of spindle-shaped elements, covering the elastic tissue, which appeared to be unchanged, excepting that in places it was broader. There can be no doubt that a new connective tissue formation had arisen in close connexion with the trabecular work of the lungs. From the walls of the alveoli of the lung, threads projected into the cavity, simple or branching, and these were beset with cells projecting at the sides, and giving the appearance of a thorn stick. These had double contours, and besides the cells possessed hooked and screw-like outgrowths, with a double contour, and of the same diameter as the threads themselves, and were undoubtedly the lung-capillaries. In places these contained true blood-corpuscles, and many trabeculæ of the lung parenchyma contained a network of such vessels, in whose meshes were the spindle-shaped cells. The nerves of the lung were often quite clear. The walls of the bronchi, as well as the interlobular cell material, had no connexion with the new elements, the capillaries, owing to the new formation being separated and isolated. As regards the question of the first origin of the cells which were changed into the spindle-shaped corpuscles, the author relates the case of a girl, aged twenty, in whose lung, which was becoming indurated, the cells were full of exudation matter, and the epithelium and alveoli gone. In the lower part of the lung the parenchyma was more than usually transparent, and in the walls of the alveoli, besides the nuclei of the vessels, round and oval nuclei of from $\frac{1}{450}$ to $\frac{1}{500}'''$ in size were seen; and in the upper lobe they existed in heaps of from two to four in number. Nuclei, with two nucleoli, were also seen. Very often beyond the boundary of an alveolus very delicate meandering lines passed, within which nuclei, from one to three lay close together; and similar accumulations were also found within the trabeculæ themselves. Within the same lines bulging out blood-corpuscles were seen, and there seemed to be no doubt that the finely-contoured lines were the boundaries of corpuscles. No question arose as to what became of the fast-growing and increasing nuclei. No doubt the spindle-shaped cells have all the properties of formative cells of connective tissue, and finally pass into areolar tissue. By degrees the lung obtains almost a tendinous coherence, and nothing remains visible but areolar tissue, and a few vessels and pigment particles. The closure of the alveoli seems dependent on the shrinking of the newly-formed areolar tissue. The bronchial tubes appear to be thickened as to their walls in the later stages, their calibre being increased when only small parts of the lung are affected, and narrowed when larger parts are affected.

The author finds the nerves of the indurated part of the lung obsolete; but as he has never found the entire lung affected, he has not found the trunk of the vagus nerve affected.

OSSEOUS SYSTEM.

On Osteomalakia.—Swaagman* describes at length a case of this affection which he had the opportunity of examining, the subject of it being a woman, aged forty. The bones, which were bent, could, when recent, be easily cut with a knife; but when dried could not be bent, and were white and hard. When dry they were very light in weight—the entire arm, and scapula, and clavicle only weighing four ounces three drachms; and the whole lower extremity only five ounces six drachms.

* From the Tijdschr. der Nederl. Maatschapij.: quoted in Canstatt's Jahresbericht, 1855, p. 51.

All the bones swam in water; they were moreover diminished in size. The compact bony substance of the long bones, and the outside of the spongy bones, were very porous; and this porosity was seen by the microscope to depend upon an enlargement of the Haversian canals; but no other changes could be observed in the structure. Chemical examination showed a diminution of all the elements, and only a slight increase of the saline over the organic portions. Hence the changes undergone might properly be described as atrophy or osteoporosis; and the various accidents of bending, fracture, &c., as depending upon the amount of porosity produced. This porosity seems to be a quickening of the process of conversion of the compact into spongy tissue, and is probably owing to inflammatory hyperæmia, and therefore by no means to be confounded with the affection termed rachitis.

The following papers, bearing upon physiological and pathological micrology, are interesting, but we have not space to do more than allude to them:—

H. Müller on the Retina. (Zeitschrift für Wissensch. Zool., Band vii. Heft 1.)
R. Blessig on the Retina. (Inaugural Dissertation, Dorpat, 1855.)
Leydig on Textile Corpuscles and Muscular Fibre. (Müller's Archiv, 1856, i. and ii. p. 150.)
E. Hirts, of Zittau, on the Numerical Proportions between the White and the Red Blood-Cells. (Müller's Archiv, 1856, i. and ii. p. 174.)
Notices of Parasites, by Krämer, of Gottingen. (Illustrirte Medizin. Zeitung. Band iii. Heft 6, p. 1.)
Muller on Morbid Deposits on the Inner Surface of the Choroid. (Verhandlungen der Physicalish. Med. Gesellssch. in Würzburg, Band vi. Heft. 2.)
On Cysts of the Kidneys, by Otto Beckmann. (Virchow's Archiv, Feb. 1856.)
On the Anatomy of Mucous Polypi, by T. Billroth. (Virchow's Archiv, Feb. 1856.)

HALF-YEARLY REPORT ON FORENSIC MEDICINE & TOXICOLOGY.

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I. Toxicology.

We have grouped together, in this Toxicological Report, sets of cases illustrating, by varied examples, the effects of a few individual poisons. The reader will thus receive at a glance many important practical points, opening a wide scope for reflection.

We wish specially to say, that out of the numerous cases before us which the literature of the past few months affords, we have selected none but *bonâ fide* cases for illustration; we mean cases where the evidence was positive that the symptoms arose from poison, and nothing else, the poison itself being detected. This rule we consider as absolutely necessary in strict science. First, because the symptoms produced by poisonous agents being always pretty correct copies of one or other forms of natural disease; the mere symptoms of natural disease, if carelessly observed, or if tampered with and touched up by interested forensic persons, admit, on the bare evidence of symptoms, of being at any time transformed into effects arising from some poison. Secondly, because the symptoms arising from the same poison in different cases vary so materially that it becomes utterly impossible to establish any diagnostic system or rule regarding the effects of poisons. Our present report proves this fact abundantly. We have several cases of arsenical poisoning, without any appearance of epileptic symptoms. We have one case in which epilepsy is the marked symptom, and the seeming veritable and final cause

of death. We have three cases of sulphuric acid poisoning—in two, the symptoms and pathology are all referrible to the stomach, in the third they are all referrible to the larynx and lungs, the stomach escaping entirely. We have nine cases of strychnine poisoning; in some of these there is no sign of trismus, which some suppose to offer a point of diagnosis between strychnism and tetanus; in three cases we have trismus as one of the most characteristic symptoms. In one case, Dr. Kirk's, the symptoms collectively might easily have been confounded with those of tetanus; in another case, that related by Dr. Shaw, the symptoms might as easily have been confounded with those of hysteria.

A knowledge and an acknowledgment of these variations in the action of the same poison is then necessary. For, although it is not to be expected that diagnosis can ever lead to more than the suspicion that a poison is at work, still it is important in the observations of disease to be able to detect suspicious symptoms, so that their positive causes may be sought for and removed with greater certainty and expedition.

ARSENIC.

Poisoning by Arsenic—Treatment by Hydrated Sesquioxide of Iron.—Dr. James Walsh records several remarkable cases of poisoning by arsenic, which tend to indicate some value in the treatment by hydrated sesquioxide of iron.

Case I.—A stout man, aged twenty-three, purchased two hundred and fifty grains of arsenic, ostensibly for poisoning rats. He took the whole, and rinsing the cup, swallowed the dregs. He had taken breakfast at six A.M., and took the arsenic at noon. A girl saw him take the poison, and alarmed his friends, who made him swallow some melted butter and salt. Within an hour after he had taken the poison he was seen by Drs. Walsh and Betts and Mr. Evans. A drachm of sulphate of zinc was given, which produced free vomiting; the vomited matter was found subsequently to contain arsenic. Carbonate of iron was given, in molasses, in ounce doses, and being allowed three minutes to act on the arsenic, was then evacuated by half a drachm of sulphate of zinc administered in a pint of warm water. This was repeated six times, before the arrival of some hydrated sesquioxide.

A burning pain in the stomach, of which the patient complained, and the restless nervousness and pinched face that accompanied the pain, disappeared on his swallowing the first dose (eight fluid ounces) of the hydrated sesquioxide. This was followed by the zinc, as above mentioned, and repeated in doses of four ounces every five minutes, until there were good grounds for believing that the arsenic was nearly all neutralized and removed. To prevent the evil effects of any portion of the poison that might have passed the pylorus, Dr. Walsh gave four ounces more of sesquioxide, followed by an ounce and a half of castor oil. The oil not only acted freely on the bowels, but carried the iron before it through the whole intestinal canal. The man was about his business next morning, and had no further bad symptoms. The quantity of the hydrate used was two pounds, of the carbonate seven ounces, and of sulphate of zinc two ounces.

Case II.—A delicate man, aged twenty-five, a tailor, took six hundred grains of arsenious acid. He mistook the arsenic for cream of tartar, and had no idea of suicide. He breakfasted at eight A.M., took the arsenic two hours after, dined at noon, and, having learned the dangerous mistake he had made, called on Dr. Walsh at a quarter past twelve. Carbonate of iron was first given, followed by sulphate of zinc, and afterwards the hydrated sesquioxide of iron, with zinc and oil, were given in precisely the same manner as in the preceding case. Not a bad symptom was left, and the man was at his work next day. The remaining contents of the paper, and some of the vomited matter, both gave satisfactory proof of arsenic.

Case III.—A woman took half-an-ounce of arsenic in Jersey City, to kill herself, and crossed the ferry to New York. The police were informed of her

attempt, and brought her to Dr. Scoville, of the police-force. The treatment was the same as that pursued in the previous two cases, and with the same success. Neither stupor nor convulsions followed in any of these cases, though these symptoms are maintained by some writers to be present in all cases where large quantities of the poison are taken.

CASE IV.—A. M., aged fourteen, swallowed half-an-ounce of Fowler's solution. Dr. Walsh was called in half-an-hour after the accident. An ounce of tincture of iron and one ounce of liquor potassæ mixed, was given in doses of a tablespoonful, followed by sulphate of zinc every five minutes, for six repetitions of the dose. The pain ceased. Another dose of iron, followed by an ounce of castor-oil, operated freely, and left the patient quite well.

CASE V.—A. B., aged six years, took two teaspoonfuls of Fowler's solution, and soon suffered from pain in the stomach and vomiting. Two ounces of tincture of iron and half-an-ounce of carbonate of soda were administered in teaspoonful doses every five minutes, followed by ten-grain doses of sulphate of zinc in warm water, until one ounce of the iron mixture had been taken. Two teaspoonfuls of iron mixture and half-an-ounce of castor-oil finished the course. The patient was well next day.—*New York Journal of Medicine*, May, 1856.

[The above results are, perhaps, more satisfactory than any that have been published by one author, in regard to the hydrated sesquioxide of iron as an antidote for arsenic. It is to be presumed that the success depended on the freedom with which the iron was exhibited, and on the copious vomiting induced by the zinc.]

Poisoning by Arsenic: Treatment by Hydrated Magnesia: Recovery.—Dr. Pool relates a case of poisoning by arsenic occurring in eight persons (three men, four women, and a child a year and a half old), treated successfully by the early administration of hydrated magnesia. All the patients had partaken at dinner of a sauce with which a spoonful of arsenic had been mixed by mistake for flour. Immediately after the meal, most acute symptoms of poisoning were manifested, first in the child, and then in the others. Dr. Pool endeavoured, by the copious administration of warm milk-and-water, to encourage vomiting, which had already occurred in several of the patients, and had been provoked in the rest by inserting the finger into the throat. As an antidote, a warm mixture of calcined magnesia with water (one part in fifteen or twenty) was administered in teaspoonfuls every five or ten minutes. Half-an-hour later, the burning sensation in the œsophagus and stomach, and the severe colicky pains and the vomiting, had gradually ceased, and had given place to copious stools, which in some were bloody. The general symptoms, too, produced by the absorption of the poison into the blood, gradually disappeared, so that by eleven P.M., those even in whom the most severe symptoms had been manifested were out of danger, and most of the patients lay in a quiet sleep. In all, strong reaction set in, manifested by violent action of the heart and pulse, headache, and burning thirst; but there were no further traces of pain in the intestines or in the limbs. Copious drinking, and the use of the magnesia, were continued. On the following morning, no symptoms remained beyond some headache, lassitude, and pain in the limbs; and nearly all returned to their ordinary occupations.

Dr. Pool gives the reasons which lead him to ascribe the results observed to the chemical action of the hydrated magnesia, and not to the mere evacuation of the contents of the stomach, nor to the magnesia acting as a covering to the intestines. From a consideration of the mode of action of the hydrated magnesia in poisoning by arsenic, he concludes:—1. That this substance, even in a very advanced stage of poisoning (but always before the accession of inflammation or its results), is a sure antidote, having the power of neutralizing and eliminating the arsenic, both where it meets with it in the alimentary canal and in the more

distant parts of the body. 2. That it may be given warm in large quantity and at short intervals, whereby two important indications are at once fulfilled—those of arresting vomiting and promoting alvine evacuations. Dr. Pool considers the hydrated magnesia preferable to the hydrated oxide of iron. M. Van Hulsteyn made a qualitative and quantitative analysis of the remainder of the sauce. The quantity experimented on was four ounces (the poisoned persons had used about three-fourths of the sauce). In the four ounces, about a drachm of pure arsenious acid was found.—(*Nederlandsch Weekblad voor Geneeskundigen; and Nederlandsch Lancet*, July and August, 1855.)

Poisoning by King's Yellow (Impure Sulphide of Arsenic): Epilepsy as a symptom.—Dr. John Crawford records two cases of children—a girl, seven years old, a boy, four—who, at eight o'clock A.M., took by accident king's yellow, which had been mixed with pease meal. The amount taken by the girl was much more than by the boy, but the exact quantity could not be arrived at, though it was possibly as much as from eighty to ninety grains. The children were not seen by a medical man until nearly four hours had clapsed; but meantime emetics, olive oil and a drop of croton oil, were, as it would seem, given to the girl. In spite of the medical treatment adopted, the girl gradually became worse, and at two P.M. she was seized with *an epileptic fit;* the symptoms of irritant poisoning, vomiting, epigastric pain, and tenderness continued; the convulsive fits recurred several times, and in one of them she died at nine P.M., thirteen hours after taking the poison. The boy recovered.

Post-mortem Examination.—The inner coat of the stomach over three-fourths of its extent was highly inflamed, and on its posterior surface there was a patch, irregularly circular in form, and an inch and a half in diameter, where the inflammation had evidently been particularly intense. Over this part there was a layer of newly formed lymph, in which were enveloped a number of shining yellow particles, producing a bright yellow stain, and which, when examined under the microscope, exactly resembled the commercial sulphide of arsenic. The intestines were not inflamed; the other viscera were healthy. Some pultaceous fluid in the stomach, the liver, and the intestine all yielded arsenic by Reinsch's and Marsh's processes. Six drachms of urine exhibited no trace of the poison.

Dr. Crawford remarks that epilepsy occasionally occurs in lingering cases of arsenical poisoning, the fits coming on after the irritant symptoms have subsided. In this case they appeared during the acute stage. The effusion of lymph in the stomach was remarkable, being rarely met with except in cases of irritant poisoning. Beneath the stratum of lymph the villous coat was of a deep violet colour, the rugæ thickened, rounded, and tumid, and even the impress of the reticulated disposition of the lymph was observable, a circumstance to which Dr. Christison has directed attention as being of a striking and decisive character.

Our author also points out with force that the "Act to regulate the sale of arsenic," while it prohibits the retail of arsenic unless mixed with soot or indigo, bears in its last clause, "that in the construction of this act, the word *arsenic* shall include arsenious acid, arsenic acid, the arseniates, and all the *colourless* preparations of arsenic." On the sale of the sulphides, therefore, no restriction is imposed, and the smallest coin may purchase a poisonous dose at any drug or colour shop.—*Glasgow Med. Journal*, April, 1856.

Electro-Chemical Method of Detecting Arsenic.—Professor Edmund Davy has communicated to the Royal Dublin Society the following mode of detecting arsenic in organic solids and fluids. The apparatus is of the simplest kind. It consists of two slips of different metals, generally zinc and platina. The zinc is used in the state of foil or thin sheet, the platina as foil; in some cases a spatula, with or without a spoon at one end of it; and occasionally a small crucible.

The spoon is well adapted for concentrating or boiling, nearly to dryness, fluids which may contain arsenic in extremely minute quantity. The crucible is neces-

sary in cases where it is desirable to convert metallic arsenic attached to its bottom into arsenious acid, and collect it on a surface of glass covering the crucible. The size and thickness of the platina foil may vary; but Professor Davy generally used a foil about two inches in length and two-thirds of an inch wide, and a foil of zinc of one inch or an inch and a half long from one-third to an eighth of an inch wide, and tapering to a point at the end. One slip of platina foil will answer for an indefinite number of experiments; so also will one slip of zinc. It is necessary only to heat the platina foil by the flame of a spirit or candle, if arsenic has been deposited on its surface by previous use, and to wash in water and wipe the zinc, or remove the blackened part by cutting it off.

Muriatic acid or sulphuric have to be used in these researches; they, therefore, must be tested as well as the zinc prior to being brought into play as tests. These are tested as follows:

Muriatic Acid.—One or two drops of the acid being put on the platina foil, keep in contact a point of a slip of zinc with the platina, in about the centre of the acid for one or two minutes; if the acid contain arsenic, a permanent bluish spot will be produced on the platina. The foil being washed and dried, the spot will readily disappear on exposing the foil to the heat of the spirit-lamp. If the zinc contain arsenic, a portion of it will be strongly attached to the platina, and will disappear by heat, producing the characteristic odour of garlic.

Sulphuric Acid.—Two or three drops of the sulphuric acid are to be added to an equal bulk of water; then about six drops of pure muriatic acid are to be added to the dilute sulphuric. Two or three drops of the mixed acids are now to be put on the platina foil, and the zinc applied as before. In this way arsenic may be detected in sulphuric acid when a pint of the acid contains only a grain.

Professor Davy adds many proofs of the delicacy of this test and its mode of application. He mixed five grains of solid arsenious acid in a basin of pea soup. A platina spoonful was boiled nearly to dryness; several drops of muriatic acid were then added, and after mixture, most of the solid matter was dissolved, forming a thickish fluid; the zinc being applied, a whitish coagulum, changing to brown, appeared, and the arsenic soon covered the surface of the spoon.

A fly was killed by a solution of arsenious acid in sugar. It was only necessary, without further preparation, to bruise it, in contact with a few drops of muriatic acid, on a platina surface, and apply a slip of zinc, when the arsenic was readily precipitated on the platina. Arsenious acid was also mixed with butter, lard, oils, bread, paste, starch, syrup, sugar, in powder, wine, vinegar, milk and cream, bile discharged from the stomach, yolk of egg, and other organic substances, and was detected in all these with equal facility. In cases, however, where the proportion of arsenic is very minute, a small interval of time is required to effect the deposition. And there is an advantage in making contact by a point of zinc; for the action seems to be, that one part of the arsenic in solution is precipitated on the platina, being the negative metal; while a very minute part is carried off as arseniuretted hydrogen.

A quantitative analysis may also be made by this process. With a view to gain some approximation as to the actual quantity of arsenic that could be detected by this plan, Professor Davy placed on a new slip of platina, weighing 22·14 grains, five drops of an aqueous solution of arsenious acid, and three drops of muriatic acid: a slip of zinc being applied, the arsenic was soon reduced, and much of it adhered to the platina, which, after being washed with water and dried, was found to have acquired an increase of $\frac{1}{500}$th part of a grain. The foil was heated in a retort, and a delicate white film of arsenious acid rose and condensed in the upper part of the bulb of the retort. The platina was left quite clean, and of the same weight as at first. The quantitative experiment given above affords no idea of the extreme limits to which this microscopic method of detecting arsenic may be carried.

The electro-chemical method of detecting arsenic combines the reduction of arsenious acid to the metallic state, and its subsequent oxidation or reconversion

into arsenious acid. This can be effected where the poison is in the most complex organic mixtures, and in minutest proportions.—*Journal of the Royal Dublin Society*, July, 1856.

Arsenical Poisoning in the Horse.—Mr. Edwin Taylor gives a very interesting history of two horses poisoned by arsenic. The symptoms were great prostration; violent twitching of the muscles all over the frame; constant abdominal pain; animals sometimes lying down and rolling about; purgation violent, about every ten minutes, the dejections being dark-coloured and offensive; the mucous membrane of the eyes and the nose of a bright scarlet colour; the pulse from ninety-four to ninety-six beats per minute.

The post-mortem signs ran as follows, these signs extending to two other horses poisoned also by arsenic and examined after death, but not attended by Mr. Taylor:—The stomach was highly inflamed; the mucous membrane peeled off in places, and forming a coating to the contents. The cæcum and colon were highly inflamed and black in places. The lungs were much congested.

Arsenic was detected in the bodies of these animals, but none in the corn on which they were fed. A charge was brought forward against two servants at Guilford by the owner of the horses, but no evidence of a conclusive kind as to the mode of administration of the arsenic could be brought against any one. In the course of the trial it was elicited that it is no uncommon thing to give arsenic to horses in small doses, for the purpose of improving the coat; a practice on which the judge spoke with proper reproof.—*Veterinarian*, Sept. 1856.

ANTIMONY.

Slow Poisoning by Antimony.—A case of antimonial poisoning at Bolton-le-Moors has attracted much attention. From the depositions placed in our hands, and from the facts adduced at the trial, we infer that the influence of antimony in accelerating the death of the man, McMullen, husband of the prisoner, was proved. The antimony was administered for a long period, at varying intervals, and in doses possibly of from one to five grains, combined with cream of tartar; this combination forming a compound commonly sold in Bolton under the name of "quietness," for women to give to their drunken husbands. The symptoms were at first those of dyspepsia attended with vomiting, but in the last days of the patient they were much more aggravated. There was vomiting, pain in the stomach, prostration, and ultimately typhoid sinking and jaundice. It is worthy of remark that, for the last four days at least, the patient had no antimony, a guard being kept over him. The autopsy disclosed many of the specific signs of antimonial poisoning—viz., injection of the stomach, duodenum, rectum, and inner surface of the bladder; semi-fluidity of the blood and pulmonary congestion. At the same time, there was marked evidence of old-standing organic disease. The lungs were emphysematous. There were pleural adhesions, and a slight effusion into the pericardial cavity. The bowels were loaded with scybala, and had been constipated previous to death. The liver was congested, but the cystic and hepatic ducts were pectalous. The right kidney was congested. The analysis, very carefully made by Mr. Watson, showed antimony to be present in the liver, kidneys, spleen, urine, and in the scybala; but absent in the stomach, intestines, lungs, and heart. The poison was also detected in tea and in some medicine which had been given to the deceased by the prisoner. The liver was the chief *dépôt* of the poison.

There are many points of interest in the symptoms of this case: as the constipation, the seeming absence of diaphoresis, and the jaundiced condition preceding death. An attempt was made by the defence to prove that the case was one of natural gastro-enteritis; but this argument failed, and the prisoner was transported for life on a verdict of manslaughter.

Physiological Deductions regarding Antimony.—A long-continued and careful series of experiments have been made by the writer of the present report, on the

subject of antimonial poisoning. The experiments have now extended over several months, and have formed the subject of two communications to the Medical Society of London. The following are the conclusions arrived at :—

1. That antimony, both as regards the symptoms it induces and the pathological results arising from its administration, excites effects in the dog identical with those which it excites in man; and that experiments on dogs thus afford a fair basis of comparative research. 2. That the skin, peritoneum, cellular tissue, lungs, all absorb antimony in its soluble form with as much certainty as the stomach; and that, whether introduced by any of these channels, or by direct transfusion into the blood through the veins, the diffusion of the poison is equally complete, and its effects specifically the same. (Absolute.) 3. That, after any such mode of introduction, antimony may be detected in the vomited and purged matters, in the stomach and in the contents of the stomach, in the intestines and their contents, and in the lungs, liver, kidneys, blood, urine, heart, and even in serum effused into cavities, if such be present. (Absolute.) 4. That, consequently, the detection of antimony in vomited or purged matters, in the stomach or the contents of the stomach, or in the intestines or in their contents, can no longer be considered as any judicial scientific proof that the poison was introduced into the system by the alimentary canal at any part, as has been assumed. (Absolute.) 5. That antimony, being absorbed with great rapidity wherever introduced, the point of surface at which it is taken into the system may afford slighter indication of the presence of the poison than any other parts of the organism: *ergo*, that the point of introduction can never be proved by mere chemical analysis. (Absolute.) 6. That antimony applied locally, so as to admit of being rapidly absorbed, seems to excite but little amount of local injury, although it exerts marked local effects when brought by the blood to any surface for elimination: *ergo*, that the appearance of intense redness or inflammation in the stomach or other part of the alimentary canal, in supposed cases of death from antimony, is no scientific proof, nor yet indirect evidence, that the poison was received into the system by this canal. (Absolute.) 7. That the symptoms of poisoning by antimony by large doses are, as a general rule, those of vomiting, purging, and rapid collapse; and that the same symptoms, somewhat modified in their course, result from small doses repeated frequently during a prolonged period. 8. That to this rule exceptions occur: to wit, that antimony, when thrown into the system in a large dose, and in such a way as to prevent its digestion, as by direct injection into the veins, may destroy the muscular power so suddenly that the symptoms of vomiting and purging may not present themselves. And, again, that when introduced very slowly, as by application to a small wound, it may also destroy by producing simple exhaustion, without the specific symptoms of purgation or vomiting. 9. That, in all forms of antimonial poisoning, death occurs mainly from failure of the circulation; the respirations being continued after the cessation of the heart's beat. 10. That the pathological appearances incident to antimonial poisoning are—(*a*) general congestion; (*b*) marked fluidity of the blood; (*c*) intense vascularity of the stomach in the course of the greater curvature, and, in some cases, of the rectum and other parts of the canal, but without ulceration; (*d*) a peculiarly pale yellow or occasional dark glairy secretion on the alimentary surface. Lastly, contrary to the statements of Magendie, antimony seems to excite no other pulmonary lesion than simple congestion. 11. That the election of antimony by different parts of the body is as yet an open question; that the liver, however, would appear to be the structure in which it is most collected when the administration is slow and in small doses; and that the elimination of the poison is attempted by all the secreting surfaces. 12. That, in rapid poisoning, the fatal effect seems due to direct chemical change in the blood, and to indirect effect therefrom on the heart; while, in slow poisoning, there is superadded an interference with the assimilative powers, the result of the lesions excited in the stomach and other parts of the alimentary canal.

We have further to remark that, in animals dosed for a few days with antimony,

and then kept for periods of seven, fourteen, and twenty-one days, antimony was found in each case in abundant proportions in the liver, and in smaller proportions in the kidney and heart; and also in the contents of the stomach in cases where the animals were destroyed during digestion of food.

The "tolerance" of antimony seems to us to depend entirely on the free elimination of the poison by the kidney.

LEAD.

Effects of Acetate of Lead on Birds.—From a series of experiments on the effects of acetate of lead on pigeons, Dr. Falck, of Marburg, arrives at the following conclusions:

1. Acetate of lead acts as a poison on pigeons, whether administered for a length of time in small doses, or in large doses when the œsophagus has been ligatured so as to prevent its expulsion. 2. Given in moderately small quantities in the food, it diminishes or destroys the appetite of pigeons. 3. This loss of appetite under the influence of acetate of lead, is by no means a result of inflammation of the *primæ viæ*, but decidedly of dyspepsia produced by the poison. 4. The dyspepsia depends on the precipitation by the acetate of lead of the fermentative principles contained in the gastric fluid. This is in accordance with the experiments of Wasmann, who found that acetate of lead precipitated pepsin, and converted it into an inert compound. 5. While dyspepsia is established under the influence of moderately small doses of acetate of lead, the blood and organs of the animal undergo a gradual decomposition, and are evacuated in the form of excrement and perspiration. 6. As, under the dyspeptic state induced, the proper renovation of the blood and organs cannot take place, the result is, that the organs waste, and are diminished in size. 7. Before pigeons die under the influence of moderately small doses of acetate of lead, they lose a certain proportion of the mass of their body, equal to that which results from deprivation of food. 8. The manifestation of lead toxæmia and cachexia observed in man, do not, with the exception of emaciation, occur in pigeons. In fact, the peculiar colouring of the skin and fætor and discoloration of the mouth are absent. 9. Lead colic, which frequently occurs in man, is not found in pigeons. 10. The disorders of digestion and nutrition produced in pigeons by the introduction of moderate doses of acetate of lead, agree in every respect with those which follow the administration of oxide of lead. 11. Large doses of acetate of lead produce in pigeons vomiting and diarrhœa, and, if the poison partly enters the respiratory passages, cough and difficulty of breathing. 12. When large doses of acetate of lead are prevented by ligature of the œsophagus from being vomited, they produce well marked erosion and inflammation of the *primæ viæ*. 13. The erosion of the œsophagus and *primæ viæ* through large doses of sugar of lead, is the result of a chemical action of the poison on the tissues of these organs, and takes place in dead as well as in living pigeons. 14. If large doses of acetate of lead are frequently administered without preventing the evacuation of the poison by vomiting, the process takes place, and is accompanied, in place of inflammation, by a disordered condition, which ultimately causes death by dyspepsia and wasting.—*Deutsche Klinik*, July 26, 1856.

SULPHURIC ACID.

Poisoning by Sulphuric Acid.—CASE I.—M. Benzi relates the case of a man, aged fifty-four, who, on July 23rd, 1855, took upwards of three drachms of commercial sulphuric acid, for the purpose of suicide. The symptoms were remarkable. The muscles of the face were convulsed, the eyes sunken, the countenance fixed; *the muscles of the upper extremities and of the back were in a state of clonic spasm*; he had obstinate vomiting, returning every two or three minutes; he was speechless, but the mind was clear. The mouth was half open; the lower lip was swollen; saliva abundant; the tongue was tumefied, pale, and hard, with black spots at the edges; the whole mucous membrane of the mouth was swollen; he had a burning

sensation in the mouth, pharynx, œsophagus, and stomach. The intestines seemed to be unhurt. The pulse was almost imperceptible; the body was covered with a cold sweat.

Treatment.—Two drachms of carbonate of magnesia were given in about nine ounces of water, but of this the patient only swallowed one-third, and with a great effort. In a few minutes the vomiting returned. At a later period, about three ounces of the antidote were taken. The vomiting returned and lasted four or five minutes, and went off till the following morning. The pulse was larger; he had pain in the alimentary canal, acute pain in the stomach, and constriction of the pharynx. Ice applied externally could not be borne. The salivation was more copious. On the following day (24th), he had nausea with attempts to vomit, and had passed a restless night; he had fever and difficult deglutition. Ice and sugar-water were given, and he was bled twice. On July 26th, he was better; emollients and the ice were continued, and again he was bled. On July 28th, speech and deglutition were easier. An ounce of sulphate of magnesia produced copious stools. July 30th, the epithelium of the mouth was detached; almond emulsion with borax were ordered as a gargle. On the 5th of August, he was able to take solid food, and left hospital well on the fifteenth day.—*Gazetta Medica Italiana, Stati Sardi, et Gazette Médicale de Paris,* March 22, 1856.

Case II.—Dr. Popham records the case of Alfred Winstanley, a soldier, a man of great strength, and about thirty-six years of age, who was admitted into the North Infirmary, Cork, on the morning of June 18th, 1851, with symptoms of corrosive poisoning by some mineral acid. Part of his lips, and the interior of the mouth and pharynx, were stained of a greyish or slightly brownish colour; at the corners, the lips retained their natural appearance. On his soldier's jacket, brown stains existed. He suffered most excruciating pain, moaning loudly, breathing with difficulty, and keeping both hands clasped on the epigastric region, to which he referred all his distress. His entreaties for relief were heartrending; still he was greatly averse to swallow any medicine, from the agony to which it gave rise.

The poison from which the symptoms arose was sulphuric acid, of which the patient had swallowed half-a-pint, with a suicidal intent, owing to a love disappointment. He drank off the contents of the cup, and instantly sprang upwards from the ground, screaming violently. Death ensued about twenty hours after taking the poison.

The main features of the autopsy, which was held twelve hours after death, consisted in intense cadaveric rigidity, engorgement of all the veins with black, tarry blood, congestion of the lungs with dark blood, discoloration of the œsophagus, entire disorganization of the gastric mucous membrane, inflammation of the duodenal mucous membrane, a comparatively healthy state of the remaining small intestines, extensive disorganization of the mucous membrane of the large intestines, and deep injection of the brain, so as to resemble capillary apoplexy.

Dr. Popham, in remarking on this case, which may be regarded as a model of a forensic report, dwells on the protective influence of the epiglottis in preventing the acid from entering the windpipe; on the effects of the poison on the muscles; the sudden convulsive spring after taking the poison; the excessive rigidity of the muscles, as connected with the fluidity of the blood, which persisted long after death; the total loss of coagulation of the blood; the venous colour of the arterial blood, and the unusual darkness of the venous blood; the unclouded state of the intellect with such a state of blood and such congestion of the brain; and the escape of the small intestines, as compared with the duodenum above and the colon and large intestines below.—*Dublin Quarterly Journal of Medical Science,* May, 1856.

Case III.—Dr. John Crawford reports a case of this nature. A young woman

took by accident a mouthful of the acid, mistaking it for vinegar. She instantly spat out the liquid, declaring she was burned. Water was poured down her throat, olive-oil was applied to the lips and external parts, and magnesia was administered as an antidote. The patient, however, continued to get worse, and next morning, about twenty-two hours after the fatal mistake, she died.

The post-mortem examination was made forty-eight hours after death. Externally, a brown streak or stain, exactly of the colour which sulphuric acid produces on the skin, ran downwards from each of the angles of the mouth to the chin, and over the right breast was a patch of the same colour, the skin thus stained having a charred and hardened look. The lips and gums were swollen and soft, and had evidently been affected with violent inflammation, which in spots had made considerable progress towards gangrene. The lining of the mouth was corroded, softened, and of a greyish colour; the surface of the tongue was corroded, softened, and whitish; the pharynx, especially at its upper part, presented nearly the same appearance; but there was no trace of corrosion or inflammation, either in the œsophagus or stomach. Considerable inflammation, but no distinct œdema, surrounded the glottis; the lining of the larynx and trachea was highly injected, that of the bronchial tubes more so, while both lungs presented throughout the well-known appearances of the first stage of pneumonia.

Dr. Crawford observes that toxicologically the main interest of this case consists in the effects of the poison being confined exclusively to the mouth, pharynx, and expiratory passages. Death was caused by the acute laryngitis, bronchitis, and pneumonia. It is very doubtful if a single drop of the acid reached the stomach. Ryland, in his work On the Diseases and Injuries of the Larynx and Trachea, states as a singular fact, that the larynx suffers injury from the swallowing of any of the strong acids only when they are taken accidentally in mistake for some other liquid. In cases of suicide, the larynx is never injured—the epiglottis, in the act of swallowing, completely covers the upper surface of the glottis, and the corrosive acid passes down the œsophagus to the stomach without impairing in any way the organization of the larynx. But if the acid is taken accidentally, immediately that it reaches the gullet, the mistake is discovered, violent action of the pharynx is excited, and the corrosive liquid is rejected through the mouth and nostrils. In this violent and spasmodic effort, the epiglottis is pushed up, and some few drops are readily forced into the glottis. Porter, another writer on the larynx, expresses the same view. In this case, possibly, the inflammation passed downwards from continuity.—*Glasgow Medical Journal*, April, 1856.

The three cases here given are, in their collective sense, most instructive. In the first two cases the patients swallowed the poison intentionally; in them the glottis escaped: in the last case the poison was taken by accident, and the glottis and air passages were the parts mainly affected. Thus Ryland's and Porter's views, above narrated, are strikingly corroborated. In the first case, the quantity of acid swallowed was not less than in the last, yet, owing to the glottis remaining uninjured, recovery took place; the treatment being mainly the same in both cases. In the second case, a half-pint of the poison was swallowed, and yet life was prolonged to within only two hours less time than in the last case, where but a few drachms were taken into the mouth, to be instantly spat out again. It is interesting to compare with Dr. Popham's case a suspected case of poisoning by sulphuric acid, which we gave in our last Report from 'Henke's Zeitschrift.'* In the case there referred to, the brain is also spoken of as being preternaturally *hard*, with effusion of serum both in the ventricles and between the cerebral membranes. The case, it is true, is doubtful, as a long interval elapsed between the supposed time of poisoning and the death. The condensed state of the brain may, neither in this case nor in Dr. Popham's, bear relation to the effects of sulphuric acid as a poison; but the coincidence is worth remembrance.

* See British and Foreign Medico-Chirurgical Review for April, 1856, p. 519.

STRYCHNINE.

Poisoning by Strychnine.—Case I.—Drs. Lawrie and Cowan record the following case of strychnine poisoning. A medical man, aged twenty-two, while labouring under great excitement, the result of a debauch, took three grains of strychnia in the bedroom of his hotel, concealed the empty bottle behind the grate, undressed, and went to bed. He slept, according to his own account, but not very soundly, for an hour and a half, his rest being interrupted by dreams, some of which were of a delightful description. He awoke in a spasm, uttering loud cries which alarmed the household. On the cessation of the spasm he fainted; and on coming to himself, requested the servant to go for Dr. Montgomery. On that gentleman's arrival, suspecting that poison had been taken, he dissolved some sulphate of zinc in water; but on commencing to administer it, the first drop that touched the patient's tongue induced a violent spasm, accompanied with loud shrieks, and complete opisthotonos. On the subsidence of the spasm, by introducing his finger to the back of the mouth, and carrying the spout of the drinking cup over it, Dr. Montgomery was enabled to get the emetic partially swallowed. He repeated the dose three or four times. Free vomiting having been induced, the inhalation of chloroform was immediately commenced. At 4 A.M. Dr. Lawrie saw the patient, and, in addition to the continuance of the chloroform, administered a stimulant enema. Between the hours of 4 A.M. and 6·30 A.M. nine spasmodic attacks, more or less severe, occurred. The last of these, which seemed to be induced by the application of a cup to the lips, was very intense and prolonged. The patient started suddenly up in bed, his whole frame being in a state of complete rigidity. The respiration, at first impeded, became suspended; and it was only by the long continuance of artificial respiration that it was restored. The limbs were rigid, and the fingers clenched. The pupils were dilated. During the spasms evident relief was afforded by forcible extension of the body. In the intervals there were constant twitches of the extremities. The skin was warm and moist. The pulse was at first extremely rapid, but gradually diminished in frequency. The urine was passed with difficulty. The mind was perfectly collected. From half-past 6 till 2 P.M. the patient was kept by Dr. Cowan almost continuously under the influence of chloroform. The twitches remained till the following day, and the patient then rapidly recovered. It should be remembered that the emetics acted well, and that some of the undigested dinner of the previous day was found among the rejected matters. The patient had taken a hearty meal at 4 P.M., before swallowing the poison.—*Glasgow Medical Journal*, July, 1856.

Case II.—Dr. Stevens, at the Glasgow Medico-Chirurgical Society, related the following case. The man was a patient in the Glasgow Royal Infirmary, under the care of Dr. Weir. The symptoms of strychnine poisoning commenced on April 1st, 1848. The patient was a paralytic, and at the time that the alarming symptoms appeared was taking the eighth of a grain of strychnine in solution twice a day. About twenty minutes after taking not more than his usual dose, he began to have frequent startings, and slight pain in the lumbar spine, shooting thence down the legs. These did not amount to much more than violent twitchings, but he was much alarmed, and sweated profusely. In this condition Drs. Steele and Stevens saw him. On rising up that the spine might be examined, he was seized with a violent tetanic convulsion, in which there was complete opisthotonos, and great difficulty in breathing, as well as severe trismus. The fit continued about four minutes. During it he was quite aware of his condition, and in much pain, but could not speak. Chloroform was now administered. The pupils, which were before dilated, now became more so, and in a few minutes he was insensible. The spasms in the meanwhile became less and less severe, and the inhalation being shortly discontinued, he awoke free from pain. He could not immediately speak, but after stammering a little, he complained of weariness, and

spoke of the fit as having occurred the night before. After this the twitchings continued for an hour, but less frequent, and ultimately he quite recovered.—*Ibid.*

Case III.—Dr. Kirk relates that on May 10th, 1849, he visited a young man who was supposed to be unwell. He found him in bed, but could discover no signs of disease. Dr. Kirk had barely returned home when he was recalled, a paper having been found in which the patient confessed to having taken poison, but did not say what poison. Sulphate of zinc was given in warm water. The symptoms of poisoning now began to show themselves, and the first noticed was spasm of the neck. The patient could not be raised, and he had to be fed with the emetic in spoonfuls. Next his teeth were so firmly clenched that two men could not separate his jaws; then his knee-joints became as rigid as bars of iron; and lastly, his body was raised off the bed, and rested on the head and the heels. The pupils were widely dilated; he perspired freely, and complained of pain at the pit of the stomach. The spasms were slight at first, but soon became terribly severe, but alternated with intervals of repose. In these intervals the stomach-pump was used, and his stomach speedily washed out. The only other treatment used was friction over the spine. The patient recovered perfectly, and was well next day. The patient appears to have taken six grains of strychnine, which he had from a chemist for the presumed purpose of destroying a dog.—*Ibid.*

Case IV.—Dr. Bruce related the case of a druggist's apprentice, who, on August 12th, 1854, took from one to two ounces of laudanum for the purpose of suicide. He vomited it immediately, and not long after travelled about forty miles. On the morning of the 13th he again attempted suicide by taking about four grains of strychnine in the solid form. Shortly afterwards he confessed having taken the poison, and in about fifteen minutes Mr. Anderson, surgeon, found him suffering from a tetanic spasm, which lasted but a short time. An attempt to give emetics produced a most severe tetanic spasm. The jaw was firmly fixed, the extremities stiff, and the body bent back in a state of complete opisthotonos. Upon cessation of the spasm the stomach-pump was used. The introduction of the tube gave rise to a severe spasm, with marked trismus; upon its subsidence the stomach was thoroughly washed out with tepid water, after which he had no recurrence of symptoms. He was removed to bed, had a purgative, which operated well, and, with the exception of slight weakness, was well in two days.—*Ibid.*

Case V.—Mr. Ryland, of Birmingham, relates the following case. On April 18th, 1831, a stout man, aged forty-six, died in the hospital, five hours after taking a grain and a half of strychnine. He was under treatment for paralysis of the left side, of some standing. About six or seven weeks before his death, he had had a stroke. During a short residence in the hospital, the man had been treated by strychnine—half a grain at first, a grain at one dose each day for a week, and the morning of his death the dose had been increased to a grain and a half. Three hours after taking it, convulsions supervened, which affected both upper and lower extremities, and were much stronger in the sound side than in the paralysed one. After death, while the muscles of the left or paralysed side were in the ordinary state of post-mortem contraction, those of the right arm were, while the body was still warm, and afterwards, excessively rigid, and the fingers of that side were clenched and immovable. Towards the last, the man became comatose; and immediately before death took place, the body became rigid.—*Association Medical Journal*, June 14, 1856.

Cases VI. and VII.—*Treatment with Sweet Oil.*—Dr. Gustavus Shaw gives the history of two cases. On March 7th, 1852, at 6 p.m., a negro woman, to whom he was called, was in convulsions, with slight rigidity. She was very sensible to external impressions, the contact of a cup to her lip being sufficient to produce a severe paroxysm, lasting three or four minutes; the paroxysms recurred every five minutes, when she was left perfectly quiet. The pulse was unchanged; inspiration deep; anxiety; heat of the stomach, and a choking sensation in the throat.

Half a bottle of sweet oil was given, which was vomited; it was repeated immediately, this dose was retained five minutes, and was then vomited; it was repeated again, and in fifteen minutes again vomited. By this time the woman could speak without bringing on a paroxysm, and said, that about four o'clock she had found a piece of dried beef in the cabin, which she tasted of, and finding it extremely bitter, gave it to her children. On going to the crib where the children lay, Dr. Shaw found one of them, aged two years, in the same state as the mother. He gave the oil as to the mother, with the same success; and about twelve o'clock left them, out of danger. The woman went to work the next day. Some of the oil vomited by the woman was licked up by three dogs. These were seized with symptoms of strychnine poisoning, and died in a few hours. The facts of the case were these. Mr. Hannay, the master of the slave, had baits for wolves, and this dried beef was one of them, and contained not less than ten or fifteen grains of strychnine. It must have been in the stomach one hour before she was known to be sick. Mr. Hannay then gave her a dose of castor oil, which prevented the absorption of the poison. The woman took in all three and a half ounce bottles of olive oil, the child nearly one bottle.—*American Journal of the Medical Sciences*, April, 1856.

Dr. Shaw's history acts as a two-edged sword, in reference to oil as an antidote for strychnine. If the oil saved the negro woman, why did the dogs die that licked it up? It is clear the woman vomited the poison, and it seems that the oil excited the emetic action; whether olive oil is the safest emetic in such cases is an open question.

The symptoms in this woman's case are remarkable from their resemblance to hysteria.

Case VIII.—Mr. G. M. Jones, of Jersey, relates the case of Jane D., an under-nurse in the Jersey Hospital, twenty-two years of age. At half-past nine on the evening of August 24th, feeling nausea and sickness, she took four pills, which she obtained from one of the inmates, supposing them to be "bilious pills." In twenty minutes afterwards, being in bed, she was heard to moan piteously, and almost simultaneously uttered a loud shriek. The paroxysmal attacks recurring with much severity, Mr. Jones was sent for, and saw her at half-past eleven P.M. At that time there had been no spasm for some time, nor was there one while Mr. Jones was there, which was more than half an hour. The girl's appearance, voice, and features were as usual. The pulse was more rapid, and the temperature of the body higher, than usual. Mr. Jones ordered a dose of castor oil, and an anti-spasmodic draught, to be taken if the spasms returned. Shortly after he left, the convulsions returned, and continued with slight intermissions until her death, which occurred at half-past two, five hours after taking the strychnine. She retained her faculties to the last, and appeared to have had frightful rigidity of the limbs and opisthotonos, accompanied by a sensation of choking.

On *post mortem* examination, fourteen hours after death, the whole surface of the body, especially the arms and neck, was of a deep livid colour. The anterior parts of the abdomen and legs were less discoloured. The general appearance of the face was that of a person who had been strangled or suffocated. The neck, chest, and upper arms were œdematous. The abdomen was very tense and tympanitic. The rigor mortis had subsided in the upper extremities, but still existed in the lower. The spine was arched. The soles of the feet were flat. The fingers and thumbs of both hands were firmly clenched, except the index fingers, which were extended. The arms were extended along each side. The teeth were firmly set, the jaws rigid, the tongue partly protruded, the gums bloodless, the lips puffy and livid. Much bloody froth issued from both nostrils. Both corneæ were opaque and dull; the pupils were semi-dilated; the conjunctivæ injected. Much blood escaped on cutting through the scalp. The vessels and sinuses of the dura mater were much congested. There was some opacity of the arachnoid and pia mater, and some thick yellowish serum beneath the former. The brain was much softened: the vascular points were numerous. The ventricles contained rather

more serum than usual. The spinal canal was filled with bloody serum: the vessels of the cord were much injected. The spinal membranes were very vascular: the medulla oblongata and cord were soft, but less so than the brain. In the dorsal region of the cord, a clot of semi-fluid blood, an inch and a half in extent, was found under the membranes posteriorly. The convulsions had occurred principally on the right side; but no pathological appearance could be discovered to account for this. The stomach, which contained some half-digested fluid, presented no appearance of disease; the duodenum and jejunum were congested. The liver was large, congested, and in an advanced stage of cirrhosis. The kidneys were congested. The heart was large, flabby, and collapsed. The large blood-vessels and auricles contained a little very dark fluid blood. Each ventricle contained a dark semi-fluid coagulum, weighing about a drachm and a half. The lungs were voluminous and much congested. The blood generally, throughout the body, was fluid, and very dark.

Strychnine was distinctly discovered in the stomach by the tests recommended by Messrs. Rodgers and Girdwood, and Dr. Letheby. On inquiry, Mr. Jones was able to discover the jar in the surgery whence the pills which the girl took had been procured. Two of them, tested by the chloroform process, yielded nearly one quarter of a grain of almost pure strychnine. Rabbits and frogs, also, but especially young toads, when experimented on with the materials composing the pills, distinctly manifested the symptoms of strychnine tetanus.—*Lancet*, September 13, 1856.

Case IX.—The final symptoms in the case of Mrs. Dove, who was poisoned by her husband, may be described in a few words. They were but the repetition of previous paroxysms which had been produced by the frequent administration of the poison. On Friday, February 29, while Mr. Dove was present, she was seized with a violent attack; her breathing was much impeded, and the whole body became very rigid, and was observed to often twitch involuntarily. In the course of a few hours she improved, and continued better during the whole of the night and the next day. In the evening of March 1, when Dove gave his wife some medicine, he poured something into a wineglass, and gave to his wife: she complained of its being hot and bitter. A few minutes afterwards she was again seized with violent spasms, during which she shrieked out, her eyes became fixed, she clenched the hands of her attendants, and her whole body became perfectly rigid and arched, in which state she remained until her death, at twenty minutes before 11 P.M.

Two other interesting cases of poisoning by strychnine and nux vomica will be found in the 'Lancet' for May 17, 1856.

Irregularities in the Action of Strychnine.—Dr. John Roulston, of Harrogate, states that a friend of his, residing in South Africa, wishing to destroy a large cur dog, aged about five months, gave it three grains of strychnine between two pieces of beef, which the animal bolted without mastication. He was then going on horseback into the country, and the dog followed for two miles, leaping and gambolling the whole way, and again home. After his return, the dog, which until that moment had not shown the slightest symptom of illness, and was playing with its mother at the time, suddenly, and without any spasm or tremor, leaped up in the air with a faint cry, and fell dead on the spot. The time which elapsed between the administration of the poison and death, would be at least an hour and a half. This case shows how readily extraneous circumstances may interfere with the known action of this or any other drug. In this case, exercise had no doubt completely arrested the digestive process for the time.

It is a very common plan with the farmers of South Africa to use strychnine in order to get rid of jackals, hyænas, &c., which infest their folds, and which, when dead, become a fatal meal to their successors.—*Association Medical Journal*, June 21, 1856.

Tests for Strychnia.—We have not the space to do more than give the following references on this point:—

Dr. Letheby's mode of testing will be found in the 'Lancet' for June 28 and July 12, 1856.

Messrs. Rodgers' and Girdwood's mode will be found in the 'Lancet' for June 28, 1856.

Mr. Horsley's methods of detecting strychnia and brucia will be found in the 'Association Journal' for August 30, 1856.

Mr. Copney has an excellent paper On the Chemical Tests for Strychnia, in the 'Pharmaceutical Journal' for July 1, 1856.

Physiological Action of Strychnine.—Two valuable papers on this point will be found in the 'Lancet' for June 7 and 14, 1856, by Dr. Harley.

On the questions of the detection of strychnine in the urine, the effects of alcohol and of chloroform in suspending the action of this poison, and on the condition of the heart in such cases, the reader will find some admirable comments by Dr. J. A. Easton, in the 'Glasgow Medical Journal,' July, 1856; and also by Drs. Lawrie, Ritchie, A. and G. Buchanan, and Drummond.

TURPENTINE.

Poisonous Properties of Turpentine Vapour.—Dr. L. C. Roche, referring to the researches of M. Marchal de Calvi, on poisoning by turpentine vapour,* relates a singular fact which was communicated to him forty years ago by M. Thénard. A druggist had placed in a cellar, which was rarely entered, a ton of essence of turpentine. On entering one day, he was seized with a sense of suffocation, and had to retire precipitately to avoid being asphyxiated. M. Thénard being requested to examine the air of the cellar, filled a bladder with it, and found that it contained little more than nitrogen, nearly all the oxygen having disappeared. The air in the cellar was renewed; and when an entrance could be effected, the liquid was found changed into a substance of the consistence of turpentine. M. Thénard was of opinion, as far as Dr. Roche remembers, that the essence of turpentine had rapidly absorbed the oxygen of the atmosphere. If this were so, the action of turpentine would be asphyxiating, by depriving the air of the vital element; and Dr. Roche suggests that it acts in this way rather than by the vaporisation of the essential oil.—*L'Union Médicale,* March 22, 1856.

II. Miscellaneous.

On the Nature of Rabies: its Nosological Position as a Febrile Disease.—Dr. Faber, of Schorndorf, discusses pretty fully the relations and differences between tetanus and rabies. In the course of his essay, he first contrasts these diseases, and then states his reason for assigning to rabies a place among febrile diseases.

The following are the points of differential diagnosis between tetanus and rabies:

1. In *tetanus,* the disease, as a rule, soon follows the receipt of the injury. The early supervention of *rabies* is an exception; it usually takes place at the end of months, or even years. 2. In *tetanus,* the premonitory symptoms are, painful feelings of contraction, tension of the region of the loins and back of the neck; and frequently a feeling of dulness and pain in the wound. In *rabies,* a peculiar painful sensation is felt in the cicatrised wound, extending in the course of the nerves to the back, larynx, and chest. If the wound is not yet healed, the pus becomes sanious; if cicatrisation has taken place, the scar assumes a livid colour, and becomes tumefied. 3. In *tetanus,* the motor nerves are chiefly affected, and the convulsions are of the tonic kind. All voluntary motion is greatly impaired

* See British and Foreign Medico-Chirurgical Review, April, 1856, p. 519.

or entirely destroyed. Trismus is so violent, that the lower jaw cannot be moved either by the patient himself or by others, and the mouth cannot be opened. The contraction of the muscles is permanent; even during the intervals the tonic spasm of individual portions of the muscles continues in an extraordinary degree, even causing rupture. Convulsions of the limbs occur in paroxysms; and when these have subsided, tonic contraction sets in, and the body becomes as stiff as a piece of wood. The contraction principally occurs in the muscles of the trunk, producing opisthotonos and emprosthotonos. In *rabies*, the nerves of sensation are chiefly affected. The contraction is clonic. Trismus, emprosthotonos, and opisthotonos are entirely absent. The voluntary muscles retain the power of motion; but men and animals cannot move without springing, raving, thrusting, or striking; men cannot speak; dogs, wolves, foxes, horses, &c., cannot bite; horned cattle cannot bellow. The spasm is principally in the cardiac region, hence the death anguish, which manifests itself in a very different manner in men and in animals. Paroxysmal convulsions also sometimes occur, but, according to Dr. Faber, there is no tonic contraction; the patient can move himself how and whither he will. 4. In the commencement of *tetanus*, deglutition is impeded by spasm of the pharyngeal muscles; at a later period, because the patient is prevented by trismus from opening his mouth. In *rabies*, deglutition is impeded through the whole course of the disease by spasm of the muscles by which this process is effected; trismus being absent, the mouth can be opened. In the tranquil form of the disease, the lower jaw hangs down paralysed, but can be moved by the finger (Hertwig). 5. In *tetanus*, the psychical disorder is inconsiderable. In *rabies*, the psychical affection reaches a high degree; the patient is nearly in a state of desperation. Here there is an analogy with mental disease. 6. In *tetanus*, the dread of water and the ejection of saliva are absent. In *rabies*, dread of water is very frequent, on account of the impediment to deglutition; and ejection of saliva is generally present. 7. In *tetanus*, dread of light, of glare, and of air are not constant symptoms. They are constant in *rabies*. 8. In *tetanus*, there is no delirium. In *rabies*, delirium and hallucinations are frequent in men; and the latter in animals, especially dogs. 9. In *tetanus*, the voice is frequently changed. In *rabies*, the voice is changed; hoarseness being constant. 10. In *tetanus*, there is no inordinate condition of the genital organs. In *rabies*, this symptom is very frequent. 11. There are no distinct and separate forms of *tetanus*. Of *rabies*, whether spontaneous or arising from inoculation, there are two distinct and easily distinguishable forms, which may be easily recognised in dogs—the raving and the tranquil rabies (*die rasende und die Stillende Wuth.*) 12. The course of *tetanus* is not divisible into stages. *Rabies* has three often very distinct stages—depression, irritation, and paralysis. 13. *Tetanus* may end fatally in three or four days; it may continue a fortnight; and other diseases, as fever, apoplexy, paralysis, &c., may supervene. The duration of *rabies* is always for a few days only, generally three or four; it may end in death or in recovery. Transitions into other diseases have not been observed. Paralysis is the precursor of death. 14. In *tetanus*, death generally occurs suddenly during the most violent tonic convulsion: rigidity continues some time after death. In *rabies*, death is always preceded by more or less paralysis of the lower limbs; convulsion ceases; and there is no rigidity after death. 15. *Tetanus* occurs only after greater or less injuries accompanied by contusion, as after gun-shot wounds, but especially after punctured wounds and bites of fibrous and ligamentous structures, especially of the extremities of the limbs; also after surgical operations, and after the bites of dogs and other animals which are not rabid. *Rabies* supervenes in men and animals on great and small, even on very small, injuries of any part of the body, only after the bite of a rabid animal. It developes itself in a certain family and order of animals. 16. *Tetanus* usually appears during the suppurative stage of wounds, rarely after their cicatrisation. *Rabies* generally appears after cicatrisation, rarely during suppuration. 17. *Tetanus* cannot be communicated to other individuals by inoculation. *Rabies*, as numerous experiments have shown, can be

communicated by inoculation. 18. There is a peculiar predisposition to *tetanus*, consisting in asthenia, as in drunkards, gluttons, sensualists, soldiers in the field who have undergone fatigue, or privation of any kind, &c. For *rabies*, there is no further disposition than to any other contagion. Any person who is bitten by a rabid animal is never secure from rabies. 19. *Tetanus* arises very readily from colds and repressed respiration; and therefore occurs frequently in damp climates with cold nights, within the tropics, and in autumn and winter in Germany. It also arises from violent impressions on the mind. Dupuytren observed it to occur during the revolution of July. The outbreak of *rabies* after the bite of a mad animal is altogether independent of climate, season, &c., and sometimes occurs without any cause, sometimes after depressing mental impressions—for instance, the simple remembrance of having been bitten. It also is produced by over-heating, by drink, and exercise, such as immoderate dancing; and follows the contusion of the cicatrix. 20. Recovery is frequent in *tetanus*: very rare in *rabies*. 21. *Tetanus* can be prevented by a simple treatment of the wound, while it is promoted by stimulant applications: of this an instance is known to Dr. Faber. *Rabies* is averted by stimulant treatment, and favoured by mild or sedative applications. On the appearance of the first symptoms, the disease can be cut short by rapidly and energetically re-inducing suppuration in the wound. 22. In *tetanus*, antispasmodics, and especially opium, are approved remedies. In *rabies*, opium is useless, not to say injurious.

Dr. Faber hence draws the conclusions—1. That tetanus and rabies present some points of resemblance, but when carefully examined, are found to be very different diseases. The diseases to which rabies bears the greatest analogy are erysipelatous inflammation of the pharynx and œsophagus, and certain psychical disorders. 2. That it is not every kind of injury that can induce rabies. 3. That in other diseases, not following the bite of an animal, hydrophobia may appear; this hydrophobia not being a disease, but a symptom. 4. That rabies may be communicated by contagion from one individual to another.

Dr. Faber expresses his opinion that rabies is a fever, presenting two forms—the raving and the tranquil. Originally developed in animals, it produces in them a contagious principle, which may be communicated to other animals and to man, and from these to others, by a bite or by intentional inoculation. The disease in all is the same, but the symptoms vary according to the species and the individual.—Henke's *Zeitschrift für die Staatsarzneikunde*, xxxv. Jahrgang, zweites Heft, 1855.

Dr. T. Lindley Kemp also published last year his opinions on rabies, several of which agree with those expressed by Dr. Faber. He observes that rabies is essentially an epizootic disease, and that it so prevailed in Scotland in 1835 and 1849. He further says that rabies, like all epidemic diseases, is of an acute character; and, as was pointed out by Youatt, and has been long known, it is always characterized by inflammation of the mucous membrane of the fauces, often extending to the windpipe and stomach. It appears, indeed, in the milder form, to be nearly identical with influenza. Subsequently, at least in the severe cases which attract notice, there is violent delirium, which rarely or never accompanies influenza in men.

The occurrence of delirium in animals, Dr. Kemp believes to be explained by the thinness of the ethmoid bone, and the extent and complexity of the nervous matter (especially in the dog) between the mucous membrane of the fauces and the brain. In every fatal case of rabies examined in the Edinburgh Veterinary College, whether in dogs, horses, or cattle, the brain behind the ethmoid bone was found with every mark of severe inflammation. Two morbid appearances, and two only, are constant in all cases of rabies; inflammation of the mucous membrane near the termination of the olfactory nerves, and of that portion of the brain near where these nerves leave that organ. If, then, the delirium be accidental, and the saliva be unchanged and innocuous, there is an end to the belief that the bite of a rabid dog can produce hydrophobia or any specific disease.

Hydrophobia is very rare during an epidemic of rabics. Many animals and persons must be bitten; but few are affected. Dr. Kemp appears of opinion that the symptoms which occasionally come on some time after the bite of a rabid animal, are in some way analogous to traumatic tetanus; yet that there is a difference, the disease being modified by the impression made on the patient's mind, by the nature of the accident, and by his having, in the interval, anxiously read books about hydrophobia, consulted with his friends about it, and brooded over his reflections until his mental powers have become decidedly affected. Dr. Kemp would rather classify hydrophobia with hysteria, catalepsy, and diseases of that class, which occur in those only who possess *mobility* of the nervous system.—*Edinburgh Medical and Surgical Journal*, January, 1855; and *Association Medical Journal*, June 1, 1855.

Hydrophobia from the Bite of a Cat.—Madame Sophia D., aged forty-seven, of strong constitution, was bitten on December 31st, 1855, in the ankle of the left foot, by a cat which was supposed to be mad, as it had already attempted to bite several persons. Instead of having the wound cauterized, Madame D. consulted some quacks, who, after having employed charms, assured her of a perfect cure. On February 10th, 1856, forty-two days after the injury, Dr. Sabatier was called to see the patient at her residence in Bédarieux. She felt pricking pains in the cicatrix; these ceased in a few hours, giving place to dull pains, which extended over both legs. These pains were confined to the lower limbs during February 10th and 11th, but on the evening of the last-named day, the patient began to feel darting pains in the interior of the genital organs. These were not continuous, but left some intermissions. When they recurred, they appeared to violently excite the whole nervous system. Supposing that a prurigo of the labia, to which the patient was subject, had reached the interior of the vagina, Dr. Sabatier prescribed a lead lotion and two hip-baths. The baths were borne ill, but in the evening, the darting pains had given place to disorder of the stomach, denoted by frequent vomiting. Believing that the vomiting was sympathetic with the disease of the genital organs, Dr. Sabatier again ordered baths, and prescribed antispasmodics and opiates. On the following morning, after a restless night, unmistakeable symptoms of hydrophobia were manifested in the form of spasm of the glottis, dread of fluids, impossibility of swallowing, furor, pallidity of the face, convulsive shocks, and foam at the mouth. The patient insulted all who were near her—even her husband. The pulse became quick and irregular. During the night, the symptoms arrived at their height; she escaped from the persons who had charge of her, and dashed her head against the floor of her room. Her face covered with bruises, and her hair disordered, she resembled a real fury. In the midst of the convulsions, the intellect remained perfect: she sent for her husband and son, and gave them advice. In a short time, copious vomiting of black, thick blood set in. The state of excitement continued until eleven o'clock on February 14th, when it was succeeded by a comatose state, with symptoms of asphyxia. The patient died calmly at one P.M. on that day. The treatment, from the time of the manifestation of the hydrophobic symptoms, consisted in the administration of a mixture containing opium, and in some cold affusions to the head. No *post mortem* examination was made. On examining the mouth, Dr. Sabatier found the tonsils and velum palati very red. He could not discover the vesicles described by Marochetti as being present at the sides of the frænum linguæ in cases of hydrophobia.

M. Sabatier adds that the disease had in all probability been spontaneously developed in the cat. The relatives of Madame D. informed him that the animal, after having received a burn, appeared low, and refused food for several days, and gradually became quite mad. A brother-in-law of the patient was bitten three days before her, but when Dr. Sabatier wrote, had presented no symptoms of hydrophobia. He could not, however, be absolutely pronounced free from danger. The uterine symptoms, resembling those of *furor uterinus*, have been described in a case of hydrophobia by Portal.

In speaking of the questions of early cauterization in cases of bite from rabid animals, Dr. Sabatier asks which is the best caustic? Is the actual cautery, strong acid, or the potential caustic? He suggests that a number of animals should be allowed to be bitten by mad dogs, and that then sulphuric acid should be tried on some, red-hot iron on others, Vienna paste on others, at intervals of from two to fifteen days after the bite.—*L'Union Médicale*, March 4th, 1856.

Hypospadias; Fecundation.—The following case is given by Dr. Traxel, of Kremsier:—On April 1, 1856, a new-born infant was brought to Dr. Traxel, that he might determine its sex. The father and mother were servants of a peasant. On an examination of the alleged father, he was found to have all the external characters of a male; the urethra, which was rather shorter than ordinary, but of large size, was imperforate; the scrotum was divided into two pouches, each containing a testicle. The opposed surfaces of the scrotal pouches were covered with a red skin, and the divisions extended through their entire length. At the root of the penis, in the anterior angle of these pouches, was an opening of the size of a lentil. This was the orifice of the urethra. The lower surface of the penis was grooved from the above-mentioned orifice to the end of the glans. There was no prepuce. Almost a line behind the corona glandis, and in the groove, were two elliptical openings, which readily admitted a large hog's bristle; there was a third smaller opening two lines from the orifice of the urethra. This man had always passed for a woman. He lay in the same room with the mother of the child; and they acknowledged having had frequent connexion. The woman declared that she had had no commerce with any other man for three years; and the man did not deny this assertion. The idea of cohabitation with another man was further negatived by the circumstance that the infant had the same conformation of the genital organs as the father.

How did fecundation take place? The three openings in the penis were probably the orifices of the excretory ducts of Cowper's glands. But might not these have been the openings of the ejaculatory ducts? It is to be regretted that Dr. Traxel did not examine these canals: their length and direction would have thrown light on the subject. The fact of fecundation may also be explained, by supposing that during coition the posterior wall of the vagina supplied the place of the absent wall of the urethra, thus forming a complete canal. This is the most probable explanation.—*Wiener Medicinische Wochenschrift*, 1856, No. 19; and *L'Union Médicale*, August 26th, 1856.

Influence of Consanguinity on the Offspring.—Dr. Rilliet, of Geneva, states that he is investigating the subject of the influence of marriage between relatives on their offspring. He delays publishing the whole of his researches till he has rendered them more complete; but in the meantime he gives the following results at which he has arrived.

The lowering of the vital power, as a result of marriage between near relatives, is manifested by results varying in frequency, form, and degree. The following is an enumeration of them in their logical order, though not in that of their relative frequency. 1. Absence of conception. 2. Delay of conception. 3. Imperfect conception (abortions). 4. Incomplete products of conception (monstrosities). 5. Children with imperfect physical and moral constitution. 6. Children especially liable to diseases of the nervous system, in the following order of frequency—epilepsy, imbecility or idiocy, deaf-dumbness, paralysis, various cerebral disorders. 7. Children predisposed to diseases connected with the scrofulo-tubercular diathesis. 8. Children which die at an early age in larger proportion than those born under other conditions. 9. Children which, if they live beyond early infancy, are less able than others to resist disease and death. The health of the family of the married persons, and of these individuals themselves, exercises a certain influence on the degree and kind of depression of the vital force in their children. It

is probable that all the deviations from the laws just laid down are due to the health of the predecessors, as well as to the dynamic conditions in which the relatives are at the time of sexual intercourse. Thus it is incontestable—1. That all the children in a family may escape the effect of consanguinity, but this is rare. 2. That in one family some may be attacked, while others escape. 3. That the form of disease varies in those who are attacked. Thus they are not *all* epileptic, deaf and dumb, paralytic, or scrofulous; but they are variously influenced. For example, there may be observed, in one family, an epileptic, an imbecile, a child only physically and morally retarded, and another who will succumb rapidly to a disease which any other child would have resisted. In another family, there will be two idiots or imbeciles, and two healthy children. In a third, there will be one child with congenital paralysis, and several only scrofulous, &c. If certain families appear to entirely escape the action of consanguinity, it is to be feared that its direful effects will be manifested in succeeding generations, ending in the annihilation of the family.

Although no one can claim the priority of an idea of which it is difficult to determine the origin, it is not uninteresting to call to mind the opinions of legislators, philosophers, and theologians on marriage between relations. By the law of Moses, marriages between relations were forbidden as far as the third degree. In Sparta and Athens, marriages between relations of the second degree were indeed permitted by the law; but Socrates, reasoning on physiological grounds, raised his voice against a practice which he believed to be prejudicial to the healthy propagation of the race. The Roman laws interdicted marriages between all relations of the third degree; and even, though less determinedly, between those of the fourth degree. Saint Augustine, Gregory the Great, and the Council of Trent, also interdicted marriages between relations of the second degree. In Protestant countries, the marriage of relations beyond the second degree is in general not forbidden; and it is consequently more easy to observe the effects of marriages of this kind, in families where conjugal fidelity is conjoined with the facility of union between near relatives.—*L'Union Médicale*, May 24, 1856.

QUARTERLY REPORT ON PATHOLOGY AND MEDICINE.

By Edward H. Sieveking, M.D.

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I. *On Inflammation of the Cerebral Sinuses.* By Professor Lebert. (Virchow's Archiv für Pathol. Anatomie, &c. Band ix. Heft iii. p. 381.)

The main object of this paper is to show that suppurative phlebitis of the cerebral sinuses not unfrequently results from internal otitis by direct continuity of the inflammatory process, and that it may form a connecting link between inflammation of the ear and suppurative inflammation of the meninges, the brain, and the jugulars. The author also argues that this form of phlebitis sufficiently accounts for the pyæmic symptoms and the metastatic abscesses which are presented in the cadaveric inspection of these cases.

Professor Lebert discusses inflammation of the cerebral sinuses under three heads:—1. The spontaneous, or idiopathic variety. 2. The variety dependent upon translation from internal otitis. 3. The traumatic variety.

Of the first variety the author has seen no cases himself, and has only been able to meet with three reported by others—two by Tonnellé,* and one by Castelnau and Ducrest.†

In his remarks upon the second variety we meet a protest against the prevailing

* Archives Générales de Méd., tom xix. p. 610.
† Récherches sur les Absces Multiples, p. 138. Paris, 1848.

assumption that otorrhœa mainly depends upon tubercular or scrofulous disease of the petrous bone. Those acquainted with Professor Lebert's researches may remember that he is disposed generally to deny the formation of scrofulous matter in bones, and that he asserts the cases set down as such to have been instances of ordinary suppuration. He describes inflammation of the petrous bone as the immediate consequence of inflammation of the internal auditory apparatus, from which dangerous results are to be feared; he considers that if the inflammation were confined to the cavity of the tympanum, the comparative facility with which the pus may escape would obviate the more serious symptoms. The petrous bone having become inflamed as far as its inner surface, the dura mater becomes involved, is thickened, and pus forms upon it; and now the disease may extend to the pia mater or brain. At times the dura mater ulcerates. The brain either exhibits diffuse purulent infiltration, or abscesses form, which may discharge into the ventricles. The posterior lobe of the cerebrum and the anterior lobe of the cerebellum are the parts most frequently involved. Hæmorrhage under the pia mater, or in the vicinity of the softened portion of the brain, is rarely met with. No particular predisposition distinguishes one side from the other. The connecting link between the carious affection of the petrous bone and the morbid condition of the brain is to be found in the inflammation of the cerebral sinuses. The transverse and the petrosal sinuses are those most frequently seen filled with pus. The cavernous and circular sinuses, the torcular Herophili, and even the upper part of the jugular, may become involved. The inflammation rarely extends across to the opposite side or into the neck, the extension being limited by the formation of a plug of fibrin. In the case of pyæmia resulting, the presence of pus in the veins, and its consequent introduction into the current of the blood, is sufficient to account for it.

Professor Lebert enters into the etiology and symptomatology of otitis generally. We can only make room for a notice of his description of the phenomena accompanying inflammation of the sinuses. The ordinary symptoms are the sudden supervention upon chronic otorrhœa of rigors, heat, accelerated pulse, loss of strength, oppression, and more or less general pain of the head, furred tongue, loss of appetite, thirst, in short, symptoms resembling those of the first stage of typhoid fever. The headache is more intense than in that disease, and generally soon becomes confined to one side. There is occasional delirium, generally of a quiet character. After a few days or a week, symptoms of compression appear; the patient becomes indifferent and somnolent, and gradually passes into a comatose state, sometimes alternating with periods in which the intellect is unclouded; in the same way a paralytic condition is observed to alternate with a perfect control over the extremities. The face exhibits a similar alternation on the affected side. Convulsive affections are rarely met with. The fever accompanying the disease presents an intermittent character, often marked by so much periodicity that it has even been mistaken for genuine intermittent, and treated accordingly. These febrile paroxysms indicate the pyæmia which has supervened. The duration of the disease, as recorded in 14 cases, was respectively from nine to fifteen days in 4, from twenty-one to twenty-eight days in 5, from twenty-eight to thirty-five days in 3 cases; once, thirty-seven days; once, forty-two days; and once, sixty days.

In considering the etiology of the suppurative inflammation of the cerebral sinuses, Professor Lebert expresses a doubt as to the correctness of Mr. Toynbee's statement, that diseases of the meatus and the mastoid-cells induce disease of the transverse sinus and the cerebellum, and that the cerebrum becomes affected when the disease proceeds from the cavity of the tympanum, while the medulla oblongata is liable to become diseased when the morbid process commences in the vestibulum and cochlea. His objection rests upon the ground of his not having been able, in the cases which he examined, to localize the primary disease, owing to the general destruction of the parts concerned. With regard to sex, it is remarkable that a peculiar liability is observed among males. Of 17 cases, 14 were

males, 2 females, and 1 occurred in a child whose sex was not stated. As regards age, 14 cases were found to be distributed as follows:—7 occurred between the ages of twenty and thirty, 5 from ten to twenty, 1 at nine, and 1 at forty-six years of age.

The prognosis is necessarily unfavourable; still, even in the pyæmic stage, the disease does not appear to be absolutely fatal. The treatment should be specially directed towards curing the early stages of otorrhœa, and our author strongly urges powerful antiphlogistic treatment at that time, to be carried still further when cerebral symptoms are first manifested. Venesection is then to be followed up by counter-irritation, purgatives, cold applications to the head, and opiates, if the pain in the ear is very severe. Abscesses in the vicinity of the mastoid process are to be opened early; and purifying and soothing injections are to be made into the ear. Professor Lebert, though, as we have seen, inclined to regard otitis as essentially simple inflammation, admits that it may depend upon a dyscrasia, and in such cases advises the use of cod-oil and salt-bathing.

After the supervention of the pyæmia, the author advises the continuance of purgatives and the application of the ferrum candens, as lauded by Sédillot and Bonnet, in the vicinity of the ear as well as over the parts where secondary abscesses may be suspected. At the same time, the strength of the patient is to be supported by tonics, wine, and nutritious diet. The general remarks are followed by the details of eighteen cases, partly observed by the author, partly collected from other sources; for which, as well as for his remarks on the traumatic variety of cerebral phlebitis and the illustrative cases, we must refer our readers to the Archiv.

II. *On Pericarditis.* By H. Bamberger, Professor of Clinical Medicine in Würzburg. (Virchow's Archiv für Pathol. Anatomie, &c., Band ix. Heft 3, p. 348.) *On Valvular Diseases.* By the same. Ibid. Heft 4, p. 523.

Fifty-seven cases of pericarditis, which occurred under the eye of Professor Bamberger, and of which twenty-seven proved fatal, are here analysed, with a view of determining the etiological relations of this disease. The list only includes cases of undoubted pericarditis observed by the author himself, while all cases are omitted in which traces of former pericardial inflammation was discovered after death. The first point which results from the analysis, is the infrequency of isolated pericarditis, which only occurred three times, or in about five per cent., and it is to be observed these cases were not fatal; in several of the fatal cases which were during life regarded as simple pericarditis, the post-mortem exhibited morbid conditions of other organs, which were necessarily primary to the heart affection. Professor Bamberger's observations confirm the fact of rheumatism being the most frequent cause of pericarditis; his tables yield 17 cases dependent upon that disease, or 30 per cent.,—a ratio that approaches nearer to that established by Dr. Taylor, than that by Dr. Chambers. The former found rheumatism to be the cause of 21 out of 40 cases, or 52 per cent.; the latter only found 18 out of 135 cases of pericarditis dependent upon rheumatism, or 14 per cent. The period of the supervention of the pericardial affection varied from the fourth day to four weeks after the commencement of the rheumatism; the majority of cases occurred between the sixth and fourteenth days. Next to rheumatism, Professor Bamberger finds tubercular disease to be the most frequent cause of pericarditis; it coexisted in 12 out of the 57 cases; and if we subtract 4 cases in which other complications, as aneurism and granular kidney, coexisted, there still remain 8 cases, or 14 per cent., in which tuberculosis was the undoubted cause of the pericarditis.

Professor Bamberger found 4 cases in which there was aneurism of the aorta, a circumstance at variance with Dr. Stokes' remark, that this complication is extremely rare. He is also opposed to the views of Dr. Taylor, regarding the fre-

quency of granular kidney as a complication of pericarditis, as he only met with it in 7 cases, 4 of which presented other important complications—viz., 2 of tuberculosis, and 2 of cardiac hypertrophy. He only met with 1 case of granular metastatic pericarditis dependent upon pyæmia after traumatic inflammation of the knee-joint. One other case of pericarditis with puerperal fever might be explained in the same way. Professor Bamberger has only once observed pericarditis in connexion with typhus. He adverts to the occurrence of pericarditis after scarlet fever, but does not appear to have observed it himself. The author briefly adverts to the symptomatology and therapeutics of pericarditis. With regard to the latter, we would only note the fact, that he altogether eschews mercury; not one of his patients received it; a circumstance which deserves the serious consideration of those practitioners who place their main reliance upon that drug; since the results obtained by Professor Bamberger are by no means despicable. His treatment consisted in the local application of leeches, and of the administration of digitalis, aqua laurocerasi, acidum hydrocyanicum, bitartrate of potass, acetate of potass, and the like.

The article on valvular disease is based upon the analyses of 211 cases, observed by the author himself, 69 of which were watched up to the time of death. Cases of recent endocarditis are excluded, while only such cases of valvular disease are admitted in which there was insufficiency or contraction of the orifice. The following is the summary of the analysis:—Of the 211 patients, 109 were male, 102 female; of the 69 that died, 32 were male, 37 female. The valves were diseased as follows:

Mitral alone . . .	58 males	......	79 females.
Aorta alone . . .	34 „	......	11 „
Pulmonary alone . .	2 „		
Tricuspid	1 „		

Total of single valves affected: 185 cases.

Mitral and tricuspid	5 males	......	7 females.
Mitral and aortic	6 „	......	3 „
Mitral, tricuspid, and aortic . .	3 „	......	2 „

Total of complicated valvular affections: 26 cases.

The comparison of this analysis with the results obtained by the post-mortems is interesting; the latter showed 52 cases in which single valves were affected —viz.:

Mitral alone . . .	9 males	......	22 females.
Aortic alone . . .	12 „	......	6 „
Pulmonary alone .	2 „		
Tricuspid alone . .	1 „		

The preponderance on the side of females in regard to mitral disease, and of males in regard to aortic disease, is very palpable, and is further confirmed by what is observed in the complicated cases. Among the post-mortems 17 were complicated:

Mitral and tricuspid	4 males	......	5 females.
Mitral and aortic	2 „	......	2 „
Mitral, tricuspid, and aortic . .	2 „	......	2 „

The analysis of the ages of the patients shows the greatest frequency of mitral disease to occur between the tenth and thirtieth years, and of aortic disease between the thirtieth and fiftieth. Acute articular rheumatism was ascertained to have preceded in 51 cases, or about 25 per cent. Professor Bamberger observes, that while his results correspond with those generally obtained by German observers, they differ from those obtained in England, where disease of the aortic valves is found to predominate considerably over mitral disease. It would appear that atheroma, which is the main cause of the former, is of more frequent occurrence in England than in Germany.

We are unable to go more fully into the second paper, but would recommend it to the special notice of our readers, on account of the valuable information it contains on the subject of the pathology and diagnosis of valvular disease.

III. 1. *Notice of Two Cases that gave rise to an inevitable error of Diagnosis.—Intra- and Extra-Thoracic Tumours mistaken for Pleurisies.* By Dr. E. MOUTARD-MARTIN, Physician to St. Antoine. (L'Union Médicale, June 18, 1856.)

2. *Notice of a Few Cases of Intra-Thoracic Tumours, presenting all the Symptoms of Chronic Pleurisy.* By Dr. OULMONT, Physician to St. Antoine. (L'Union Médicale, June 28, 1856.)

In the first case given by Dr. Moutard-Martin, an hydatid cyst, contained in the left lung, simulated pleurisy; it occurred in a man aged twenty-eight, who had generally enjoyed good health until a short time before his admission into the hospital, in February, 1856. He had caught cold, and was much alarmed by an attack of hemoptysis at the end of January. The posterior surface of the thorax was resonant throughout, and the respiratory murmur was audible there, mixed with mucous râles on both sides. Anteriorly, the right side was resonant throughout; the percussion was tympanitic at the left apex to the extent of two fingers' breadths under the clavicle. The remainder of the left lung was completely dull; the transition to the dulness was abrupt, and the dulness extended to the mesial line, and laterally to a line drawn from the armpit parallel to the axis of the body. The heart was pushed downwards, and towards the mesial line. There was no trace of the respiratory murmur, or of vocal resonance throughout the dull portion. Two days after admission, an amphoric blowing was audible in this part, accompanying a few deep inspirations; it was very distant, scarcely perceptible; and sometimes there was a feeble metallic tinkling. The diagnosis was general bronchitis of six weeks' date; pleurisy, with effusion circumscribed by false membranes, and limited to the left anterior thorax.

After a brief absence from the hospital, he was readmitted on the 19th of March, when the dulness of the left side had entirely disappeared, and the heart had recovered its normal position. The respiratory murmur was perfect throughout the portion which had previously been dull. Posteriorly there was marked dilatation of the left side, with complete dulness throughout, and absence of the respiratory murmur. There was no fever, the cough and expectoration continuing. The diagnosis now was effusion in the left thorax, probably caused by rupture of the adhesions, which had encysted the primary effusions; the effusion being limited in the large pleural cavity. On the second of April, febrile symptoms having supervened for a few days, the patient expectorated an immense quantity of purulent liquid, which induced a belief that a communication had been established between the bronchi and pleura. The stethoscopic signs remained the same. Repeated attacks of the same kind of cough and expectoration occurred, and on the 6th of April the patient died asphyxiated.

The post-mortem showed, in the anterior portion of the left thorax, firm adhesion of an old date, and disposed circularly; a portion of the anterior surface of the left lung was free from adhesions, and it was here that dulness and the absence of the respiratory murmur had been observed. The remainder of the left lung was completely adherent, and there was no trace of effusion. The volume of the lung was enormous, and yielded the sensation of an enormous pouch with thin parietes, completely filled with liquid. In seeking to detach the adhesions, the pouch gave way, and an enormous quantity of coagulated blood escaped, with the remains of an hydatid cyst. At one part of the pouch a communication was discovered, opening into the first division of the left bronchus. The opening was plugged with a portion of the cyst-membrane. The hydatid cyst was developed in the upper lobe of the lung, which had forced back the lung in every direction, had converted it into a fibrous state, and reduced the lower lobe to a thickness of about two centimètres.

The second case of Dr. Martin's was a young woman, aged twenty-one, in whom a similar error in diagnosis took place; it was caused by a tumour developed between the kidney and supra-renal capsule, which pushed the diaphragm into the thorax up to the fourth rib, and gave rise to all the stethoscopic symptoms characteristic of pleuritic effusion. These were complete dulness posteriorly, and to the right of the inferior half of the right thorax; respiratory murmur absent, or nearly so, in the part; with distinct egophony throughout. It is to be observed, however, that there was no cough.

Dr. Oulmont relates three analogous cases; the first was one of aneurism of the thoracic aorta, occupying the left pleural cavity, and simulating pleuritic effusion. It occurred in a man aged forty-six. The symptoms here were, cough, mucous expectoration; a sense of weight on the left side of the thorax; great dyspnœa on lying on the back or right side. The left side was a little distended, but the intercostal spaces did not project. The left thorax was completely dull below the third rib. In the sonorous part a fine vesicular respiratory murmur was heard; no respiratory murmur was heard throughout the dull portion, where also the vocal resonance was absent. The voice produced a feeble vibration of the thoracic parietes. The beats of the heart were superficial, sufficiently strong to raise the head of the observer, and slightly intermittent. No abnormal sounds were heard, nor was there any venous reflux in the neck. There was slight œdema of the lower extremities, no fever, the pulse strong.

In Dr. Oulmont's second case, the false diagnosis was caused by cartilaginous degeneration of the pleura, accompanied by abscess of the thoracic parietes. The patient was a clerk, aged twenty-one, suffering from cough, which commenced with a stitch in the right thorax. When admitted into the hospital, he presented, near the sixth right rib, below the anterior border of the armpit, a tumour of the size of a nut, elastic, dull on percussion, and fluctuating. It did not diminish on the application of pressure. The thorax was dull from the clavicle to the base of chest. There was crackling and a blowing murmur at the apex of the lung. Laterally there was no respiratory murmur in a space of from twelve to fifteen square centimètres below the tumour. The thorax was not dilated nor malformed. The voice throughout the dull part was indistinct. The dyspnœa was great. There was no fever. Paracentesis was intended, but postponed from the indications not being sufficiently positive. After death the two layers of the right pleura were found united by a dense grey layer, varying in thickness from 2 millimètres to 1 centimètre (0·78 in. to 0·39 in.), 11 centimètres long, by 8 centimètres broad. It extended from the fifth rib to the base. Below this layer was a mass of tubercle (7 centimètres by 5), and from two to four centimètres in thickness.

In Dr. Oulmont's third case, the pleuritic effusion was simulated by disease of the liver. A gardener, aged fifty-five, was admitted with cough, dyspnœa, and puriform expectoration. The dyspnœa was not much affected by position. The two sides were symmetrical. There was complete dulness on the right side, from the level of the nipple downwards; the dulness posteriorly extended from the inferior angle of the scapula downwards. There were sibilant and sonorous râles on the left side, and at the upper part of the right side. Throughout the dull portion no respiratory murmur was audible, nor was there any vocal resonance in the part. The heart presented no alteration in rhythm or sound; the pulse was feeble; there was no fever. During the patient's residence in the hospital, he had an attack of icterus, ascites, and œdema of the inferior extremities supervened. Before death there was much fever. The symptoms were entirely due to enlargement of the liver, which was pushed up into the thorax, and covered the whole left side of the stomach. The organ was of a greyish-white colour; when cut it creaked, and the cut surface did not present the ordinary appearance of hepatic tissue, but resembled in some parts scirrhus, in others it looked as if infiltrated with pus. It should be noted that the liver did not descend into the abdomen, a point of importance in establishing a diagnosis between pleuritic effusion and hepatic enlargement.

IV. *On the Deposit of Urea on the Skin and Mucous Membranes in the Typhoid Stage (Consecutive Fever) of Cholera.* By Dr. A. Drasche. (Zeitschrift der k. k. Gesellsch. der Aerzte zu Wien. Jahrgang xii., 3 and 4 Monat. Heft, p. 161.)

During the consecutive fever of cholera, when the urine is suppressed, Dr. Drasche has observed a peculiar fatty, shining perspiration on the forehead and face, which disappears on the return of the renal secretion. This perspiration, on evaporating, leaves a large number of minute crystals on the surface, in the form of micaceous laminæ, scales, and granules. The crystalline deposit is first perceived on the eyebrows, and successively appears on the temples, nostrils, forehead, upper lip, and hairy scalp; the parts look as if dusted over with fine flour; the minute crystals are arranged round the orifices of the sebaceous glands. The crystals are not found until a late period on the neck, chest, upper arms, and abdominal parietes. They were only once seen on the lower extremities. At times the crystals may be found on the mucous membrane of the mouth and fauces. Dr. Drasche found the crystalline deposit invariably to disappear shortly before death, and to be replaced by a viscid fluid. Examined by the microscope, the crystals were found to consist of broken pieces of an acicular form, some of which still preserved the acuminated termination: they were colourless. The crystals were embedded in a yellowish fatty mass, containing hair and epidermal cells. When allowed to crystallize from an alcoholic solution, long silky, colourless needles, arranged in pencils, formed, which were regarded as, and proved by chemical tests to be, urea.

The symptoms, according to Dr. Drasche, accompanying this secretion of urea on the surface of the skin, are mainly those of a disturbance of the nervous functions, especially of the brain, together with partial or complete arrest of the urinary secretion. The author has not invariably observed this cutaneous secretion of urea to be associated with complete arrest of the renal functions, as he has, in a few cases, succeeded in collecting or obtaining by the catheter a small quantity of urine, of a very low specific gravity (1004·6), with alkaline reaction, and of a dirty yellow colour. In the case of a female, recently confined, who exhibited the cutaneous secretion of urea in a marked form, the milk contained but little casein, much sugar, and a considerable quantity of undecomposed urea, but not a trace of carbonate of ammonia.

The autopsy of the cases presenting the above phenomena showed an extensive tumefaction of the bronchial mucous membrane, with a hepatized condition of the inferior portions of the lungs. The kidneys were very soft, large, and tumefied, their surface presenting arborescent injection, and the renal veins being filled with dark, viscid blood. The entire mucous membrane of the urinary tract presented a catarrhal condition.

Dr. Drasche, among 800 cases of cholera observed during the epidemic of 1855, met with the cutaneous secretion in 12 cases, all of which proved fatal during the consecutive fever of cholera. Only one of the twelve patients was a man, the others all women.

As all the cases in which Dr. Drasche observed the cutaneous evolution of urea proved fatal, it is difficult to avoid the conclusion that the fatal result was due to something else than an accumulation of urea in the blood, since the vicarious action of the skin would have prevented so uniform a mortality in the cases in which it was observed. It is to be apprehended that Dr. Drasche's observations will influence some of the current theories regarding the consecutive fever of cholera.

V. *On Spontaneous Rupture of the Spleen.* By Professor Möller, M.D., Königsberg. (Vierordt's Archiv für Physiologische Heilkunde, 1856. Heft 2.)

The following is an abridged account of a case of spontaneous rupture of the spleen, observed by Professor Möller:—

H., a labouring-man, aged fifty-three, suffered in 1853, for seven weeks, of ague, followed by albuminuria and dropsy. He recovered so far as to be able to return to his work, though slight dropsical symptoms continued to recur. On the 11th August, 1854, he was seized with rigors and epistaxis; on the 15th he came under Dr. Möller's treatment, presenting the yellowish complexion of a malarious patient, great prostration, pains in the head and extremities, vertigo, sleeplessness, and at night slight delirium. There was slight fever; tongue dry, with red tip and edges; abdomen tender; liver and spleen distinctly perceptible under both hypochondria; bowels costive. The treatment consisted in the administration of stimulants and purgatives. The liver diminished, but on the 18th August the spleen still maintained its increased size. On the 19th, he was found *in articulo mortis;* breathing stertorous; pulse 90, small; the spleen was *no longer perceptible.* Death ensued the same evening. *Post-mortem,* Aug. 20:—Pleura adherent throughout; lungs anæmic; left side of heart hypertrophied; a little black blood in the left ventricle; no blood on right side. The abdominal viscera were covered with a thin layer of greasy, dirty, brown-red blood. Five ounces of black coagulated blood lay at the hilus lienis; when this was removed, a transverse rupture of the spleen, three-quarters of an inch long, was found near the hilus. The capsule of the spleen was much thickened throughout, and presented numerous fibrous plates, and was extensively adherent to surrounding parts. The parenchyma was pulpy, and of a reddish-grey colour. The large vessels at the hilus were bloodless. Liver large, anæmic, rather fatty. The mucous membrane of the stomach and duodenum softened. The kidneys in the second stage of Bright's disease. No trace of peritoneal inflammation.

Dr. Möller gives the outlines of a second case, which ran a similar course to the last, but in which the diagnosis could not be verified by a cadaveric inspection.

Dr. Moller then analyses the 25 cases of spontaneous rupture of the spleen, which he has been able to collect, and finds that the main feature presented in the organ was softening. He is unable to gather any indication from which the occurrence of rupture could be prognosticated. In 9 of the cases, the account of the disease which preceded is so meagre, that no conclusion can be drawn as to the etiology. In 6 it occurred in the course of typhus, gastric, yellow, and malignant intermittent fever. The remainder seem to have resulted from ordinary intermittent fever, where the hot stage appears to be that which most predisposes to the occurrence. One case, not included in the above, is also quoted, in which the rupture had resulted from a perforating ulcer of the stomach involving the adherent spleen.

VI. *Practical Remarks on Diseases of the Spleen.* By Alfred G. Tebault, M.D., of London Bridge, Virginia. (The Americal Journal of Medical Sciences, January and April, 1856.)

The seaboard of the State of Virginia is distinguished by the endemic occurrence of diseases of the spleen, which Dr. Tebault considers under the following heads, which he illustrates by sixteen cases. In the introductory remarks he observes, that "infarctions of the spleen occur more frequently in intermittent than in remittent, in the latter than in typhoid fever, and whenever it is manifested in the last there always obtains a marked proclivity to the paroxysmal type." The greatest enlargements are found, not during the cold stage, but in consecutive febrile paroxysms. When chronic, they may last for years without inconvenience to the patient,* except such as arises from its bulk; a florid hue of the countenance, and an apparently healthy re-establishment of all the functions may be observed, but usually a slow degeneration results.

1. *Passive Hyperæmia* occurs during the prevalence of damp easterly winds,

* On this subject the reader may consult with advantage the analysis of Dr. Dempster's Report on Marsh Miasm: Medico-Chirurgical Review, Oct. 1855.

with gastro-intestinal derangement; pale copious urine, lassitude, and sallow skin. There is a dull soreness in the left hypochondrium, increased by pressure and lying on the left side, with more or less increased splenic dulness. The trunk in sitting curves to the left. If the patient be well purged early, the enlargement is reduced speedily; but if neglected, chronic enlargement supervenes.

2. *Active Hyperæmia.*—In this case the enlargement of the spleen takes place with greater rapidity, and is particularly apt to supervene if, on the occurrence of the fourth fit of a bilious intermittent fever, the remittent type be assumed. "The tumour advances at first horizontally, and then by its weight descends, and may spread over the abdomen, so as to extend from the left to the right ilium. At the commencement there is generally concomitant congestion of the liver, with vitiated, but not bilious, alvine secretions. When the hepatic function is restored, the spleen begins to contract.

3. *Hyperæmia with partial Organic Change.*—When cases of hyperæmia resulting from fever are left to nature, or imperfectly treated, organic change is manifested in the persistent enlargement, with an irregular surface and notched margins. An induration of the entire mass may result from repeated accessions of fever; but a complete cure may still be effected. This variety ought scarcely to be separated from the next.

4. *Hypertrophy.*—Here we find a tumour of an oblong form, firm to the touch, and of fleshy hardness throughout, and of little elasticity. The organ may increase to an enormous size, and weigh from ten to twelve pounds. The weight may be the only inconvenience; but after a time symptoms of general anæmia supervene, the blood is deficient in fibrin and red corpuscles, and the process of assimilation is generally imperfect. After death, the spleen is found to resemble a dark muscular substance in firmness and colour, and exhibits its cellular tissue much thickened. In one instance the liver was atrophied, and reduced to less than one-third its natural size. Older cases appear to be irremediable; but more or less benefit may generally be obtained by relieving the liver and improving the state of the blood.

5. *Inflammation.*—Though splenitis appears to be chiefly the result of traumatic influences, Dr. Tebault is satisfied that both an acute and chronic idiopathic variety occur. Great nicety of manipulation and care in diagnosis are necessary to determine its existence, and to avoid its being confounded with neuralgia. Dr. Tebault describes the symptoms thus: pretty constant and acute fever, with little or no remissions; pulse somewhat hard and frequent; emesis at times; pain of the spleen persistent, sharp, and increased on the least pressure, pain extending often to the left shoulder and ilium; disagreeable sense of heat in the abdomen. The margin of the spleen dips inwards as it were, and becomes more indistinct than in hypertrophy of the organ; while the central portion presents a rounded, tense, and elevated mass, which cannot be separated ever so little from the margin of the ribs, against which it presses, and is often discernible to the right, above the general level of the abdominal surface, the lower intercostal spaces are usually depressed, the trunk curves towards the left, though the patient cannot lie on that side, and the thigh is habitually semi-flexed. The temper is irritable. The inflammation readily spreads over the peritoneum, and tympany, delirium and death may close the scene. Should recovery, however, take place, plastic adhesions are contracted with the serous lining of the abdomen and viscera. The inflammation is seated primarily in the peritoneal and proper coats, but may involve the parenchyma.

This is the description of the acute form; the chronic form is more obscure, the symptoms all less prominent, the termination may be resolution, suppuration, or degeneration, and the affection may be complicated with ascites or hæmorrhages.

6. *Suppuration.*—When an enlarged, tense, and painful spleen becomes irregularly soft and yielding, while rigors, not periodic, supervene, we may suspect suppuration; and our diagnosis proves the more certain if, in addition, a hectic fever is established, and the cuticle, especially that over the tumour, appears shrivelled

shiny, and furfuraceous. Adhesions may result, and the pus be evacuated by the bowels, the stomach, or the lungs. Instances of the discharge taking place by expectoration, and another per rectum, are given.

7. *Softening.*—Degenerative softening takes place in hypertrophied spleens, unaccompanied by symptoms of inflammation. The general symptoms are those of scurvy; petechiæ form on the extremities and trunk and the mucous membranes; the gums become spongy, sore, purple; the breath hurried and offensive, while the pulse is very feeble and compressible. The organ itself is so soft as even to appear like a bag of fluids, its edge terminating insensibly among the viscera. The spleen, on examination after death, resembles a sac containing grumous or semi-fluid blood. Two cases are given in which cures were obtained.

8. *Neuralgia.*—The author adverts to this as a frequent accompaniment of anæmia, but admits the difficulty in distinguishing it from pain in the intercostal nerves, from pleurodynia, gastralgia, and the passage of renal calculi.

9. *Displacement.*—In consequence of enlargement of the spleen, the organ is occasionally dislocated altogether from its attachments.

In the second paper, contained in the April number, Dr. Tebault treats of some complications and morbid results observable in malarious cachexia, in which affections of the spleen form an important link in the chain of morbid phenomena; he considers them under three heads, hæmorrhage, anæmia, and dropsy. Some interesting remarks are added on diagnosis, prognosis, and treatment. We confine ourselves to extracting the following statement of the numerical proportion of the occurrence of periodic fevers among the white and black populace in four distinct years:

1st year	26 blacks	to	100	whites.
2nd ,, ...	15	,,	100	,,
3rd ,, ...	40	,,	100	,,
4th ,, ...	33	,,	100	,,

VII. *On the Presence of Lumbrici in the Biliary Ducts.* By Professor FORGET, of Strasburg. (L'Union Médicale, May 29, 1856.)

Professor Forget gives the details of a case of typhoid pneumonia in a female, aged sixty-five, in whom, after death, the ductus communis choledochus was found occupied by a lumbricus, one extremity of which projected into the duodenum, while the opposite end extended into the left division of the hepatic duct. This worm was fresh and well-preserved, and exactly filled out the canal. On introducing a director into the right division of the hepatic duct, it entered into an anfractuous cavity, of the size of a walnut, filled with a pyoid liquid, and containing a lumbricus, coiled up. This worm was softened, and in a state of decomposition. The part which it occupied appeared to be a dilated duct. The surrounding hepatic tissue presented about ten abscesses, varying in size from that of a pea to that of a chestnut, lined with thick pseudo-membrane. The liquid, examined under the microscope, appeared to consist of amorphous granules, fat globules, and a few yellow oval corpuscles, with granular contents in the centre.

QUARTERLY REPORT ON SURGERY.

By JOHN CHATTO, Esq., M.R.C.S.E., London.

I. *On the Employment of Cold in Gonorrhœal Epididymitis.* By Prof. SIGMUND. (Wiener Wochenschrift, 1855. No. 52.)

WHATEVER may be the success attendant upon the treatment of gonorrhœa in recent times, the number of cases of epididymitis does not seem to be diminished.

Prof. Sigmund published in 1850 an account of the advantage he had derived from treating it with cold, and all his subsequent experience has confirmed the statements he then made. Under the term he includes the inflammatory condition of the tunica vaginalis, of the epididymis itself, and of the cord, the affection of one of these parts preponderating in different cases. The form in which the tunica vaginalis becomes rapidly distended with exudation is a very painful one; that in which the inflammation of the epididymis preponderates is less so, and when there is considerable effusion into the tunica and around the epididymis, which cases are, however, rare, the suffering is excessive, and is accompanied by general disturbance. In all degrees and combinations of the affection, cold is found to be a powerful remedy, assuaging pain, preventing farther effusion, and, when continuously applied, expediting absorption more than any other means. The patient lying on his back, the scrotum is supported by means of a light suspensory, or a towel placed between the thighs, and then covered with compresses dipped in water. For the first three or four hours, the degree of cold should be only moderate, lowering the temperature then gradually, and in six or eight hours adding ice, if the application acquires heat rapidly. This degree of cold is continued as long as it gives the patient relief, but when it ceases to do so, and still more when it induces an uneasy sensation, the temperature must be raised from cold to merely cool, and the application allowed to remain on until it becomes warm. Finally, lukewarm applications are to be continued until all inflammatory appearances have subsided. The application must be constant, continuing it uninterruptedly day and night, its occasional use not sufficing. There are persons who cannot bear the application of even moderate cold, and especially when made to the abdomen, without colic, diarrhœa, catarrh, rheumatism, &c., being induced; and this is especially the case with those disposed to scrofula, tuberculosis, rheumatism, or gout. It is found, however, by experience, that even very sensitive persons will bear well-wrung compresses, providing that the degree of cold be gradually and slowly increased. Conjointly with this treatment, the patient takes a saline purgative at intervals, so as to induce from two to four fluid stools, one or two such being also procured during the diminution of the inflammation. For diet, the patient is to be limited to thin, easily-digested fluid substances, tea and coffee being prohibited during the acute stage. Young plethoric persons, in whom the symptoms run high, and are attended especially with much exudation around the epididymis, may, exceptionally, first require the application of leeches to the groin. Very severe, enduring, or increasing pain may be relieved by anodynes, and when the tunica vaginalis is much distended, a puncture or subcutaneous incision may be required; but such cases are quite exceptions, the cold proving, in the great majority, the best anodyne and antiphlogistic. At most, an anodyne is required at night, in order to secure sleep. When the inflammatory symptoms have disappeared, and the epididymis will bear the moderate pressure of the hand, we must seek to obtain the absorption of the exudation; and for this purpose, Professor Sigmund prefers Fricke's treatment to any other mode of making compression.

Numerous comparative trials have convinced him that the treatment of this affection by repeated bloodletting in nowise deserves preference, the employment of cold alone proving in its results far more satisfactory in the great majority of cases. When resorted to early, also, it exerts a very rapid effect in arresting the farther development of the affection.

II. *On Induration of the Epididymis subsequent to Gonorrhœal Inflammation.* By Prof. SIGMUND. (Wiener Wochenschrift, 1856. No. 12.)

Induration is a very frequent consequence of gonorrhœal epididymitis, the exudation becoming gradually denser and harder than during the inflammation. The part loses its suppleness and elasticity, but undergoes no increase of size

after the cessation of inflammation; nor is there any formation of new morbid structure. There is but little functional disturbance. Epididymitis most frequently occurs in scrofulous, tuberculous, delicate-skinned persons; and when there is varicose distension of the vessels of the cord. In such, it usually pursues a chronic course, and often terminates in induration. The principal seat of the induration is in the epididymis itself, but the tunica vaginalis always participates in this, if it be only to a small extent. As stated in a former article, the inflammation in epididymitis attacks different parts in particular cases; and in 1342 cases observed by the author since 1849, the seat is thus distinguished:—The epididymis alone, 61; the epididymis and cord, 108; the epididymis and the tunica vaginalis, 856; all the three parts, 317. The testis itself, in the great majority of all these cases, is but little enlarged, and the appearance erroneously denominated orchitis is due to the inflammation of, and exudation from, the internal surface of the tunica vaginalis. This becomes more or less tense and distended, and at a later period hardened and thickened, so that the inexperienced practitioner may easily be deceived as to its true nature. The induration of the epididymis may be either general or partial, and in the former case the part may at first attain more than double its normal size. After the cessation of the inflammation, however, it gradually diminishes again, and may continue to do so until it is much less than the natural size. In this way it is often reduced to the size of a hazle-nut, or less, and after some years, even to that of a pea. With the diminution in size, the induration goes on increasing, proceeding from a cartilaginous to an osseous hardness. Diminution of the testis usually takes place under the influence of general induration, but rarely when this is only partial. The surface of the indurated epididymis has a knotty, irregular, glandular feel, the skin of the scrotum sliding over it as in the natural state. There is no special pain in the indurated part, and only the usual peculiar sensation ensues upon pressure, unless there has been excess in diet, exercise, &c. The patients complain sometimes of general debility and of defective procreative powers. Melancholy also prevails, and is only explicable by the connexion of the spermatic plexus with the sympathetic. The same mental disturbance is produced in cases of complete atrophy and of loss of the testis.

The exudation does not differ in character from that met with in other parts that have been inflamed; but tubercular matter is also frequently deposited in these subjects, invading the whole epididymis, but only exceptionally going on to softening. The author has never met with cancer as a result of gonorrhœal epididymitis.

The epididymitis giving origin to the induration occurring most frequently on the left side, it is rare to meet with induration on both sides, although tubercular disease unpreceded by gonorrhœal epididymitis, is usually both-sided. Of 1342 cases of epididymitis that occurred to the author, he found the left side alone affected in two-thirds, and the right side in one-third; and he has met with it on both sides in seven cases per cent. in hospital and five per cent. in private practice, the inflammation never being simultaneously developed on the two sides, but usually at an interval of some weeks. There is always an exact accordance between the severity, extent, and duration of the epididymitis and the amount of the resulting induration. Although often a troublesome affection, it is, when properly treated, and when not occurring in persons suffering from highly-developed general dyscrasis, not dangerous. Prof. Sigmund knows several persons who have reached advanced age undisturbed; but daily experience shows us that in others its presence produces great mental disturbance. The sooner after the cessation of the inflammation the treatment of the induration is commenced, the sooner is the cure accomplished, or at all events a more rapid absorption of a portion of the exudation achieved. The scrotum must be supported by a well-fitting suspensory bandage, which does not exert compression. If there is even a slight increase of the normal sensibility, from two to four leeches should be applied along the cord every day or two, and cold applications kept to

the part constantly. As soon as this sensibility is diminished, from five to eight grammes of mercurial ointment are to be rubbed along the course of the cord and the inner part of the thigh every evening, painting the diseased half of the scrotum with iodine, for which purpose we may employ either a solution of one drachm of iodine or one ounce of iodide of potassium in six ounces of water, ointments being less useful. If eczema be induced—which may usually be prevented by washing the parts every morning—the ointment must be suspended. Daily evacuations must be particularly secured by means of aperients or clysters, so that the obstructed rectum may offer no impediment to free circulation in the cord. No advantage is derivable from either cold or warm baths; but Dr. Sigmund has found luke-warm baths, prepared with from four to sixteen pounds of salt in four pails of water, or with sea-water, accelerate absorption remarkably; although this is seldom complete, except in recent induration occurring in young persons. The internal employment of iodine, especially of the iodide of potassium or soda, assists in diminishing the size and hardness of the part; but given alone, however long continued, it is of little avail. Mineral waters and baths containing iodine and bromine are more useful, and may be longer continued. The neuralgia that sometimes accompanies the affection was found to be remarkably relieved by the employment of electricity, which yielded no satisfactory results in other respects. Advantage is obtained by the patient wearing a suspensory made of rabbit or other animal's skin.

III. *On Sub-Arterial Cysts of the Wrist.* By M. Chassaignac. (Moniteur des Hôpitaux, 1856. No. 78.)

M. Chassaignac calls attention to a form of ganglion which, placed beneath the radial artery, unless properly understood, may give rise to very serious errors. From excess of labour, or the exertions necessary to raise heavy burthens, the small tumour may acquire considerable development. The fingers of the surgeon, when applied over the cyst, are raised by the pulsations, which are remarkable for their energy and the breadth of space they extend over. This extent of pulsatile surface immediately suggests the idea of radial aneurism, and if the examination be continued with the limb remaining in its ordinary attitude, an error can scarcely be avoided. The differential diagnosis may be established by bringing the wrist into a state of forced flexion, when—whether it is that the artery is displaced, or that it ceases to be stretched over the eminence formed by the cyst—the pulsations no longer exist, and it is evident that no aneurism is present. In treating these cases, M. Chassaignac employs the iodide of potash ointment, rubbing it in every two hours during a week. On the dorsal surface we may treat ganglia with advantage by crushing them, by subcutaneous puncture, seton, or iodine injection; but in the case of these sub-arterial cysts of the wrist, which are in communication with the radio-carpal articulation, these means of treatment are not applicable. The iodine frictions give rise to no accident, and seem possessed of all desirable efficacy.

On one occasion, M. Chassaignac had the opportunity of examining one of these cysts in a subject brought for dissection. The tumour resembled an almond in form and size, and occupied the space comprised between the tendons of the *supinator longus* and the *palmaris longus*, lying on the anterior portion of the *pronator quadratus*. The radial artery in its downward progress having reached the upper part of the tumour, was at first so intimately connected with its front part as to seem to form a portion of its walls. Very soon, however, it deviated obliquely on its external side, and reached the fossette called the anatomical snuff-box. With the object of ascertaining the anatomical origin of the tumour, it was dissected with the greatest care, and separated from all parts with which it had not contracted fixed adhesions. In this way it was circumscribed for four-fifths of its extent, but posteriorly and below it was firmly fixed to the bone by a kind of pedicle proceeding from the anterior part of the lower radio-cubital articulation.

It was only, in fact, a diverticulum of the synovial membrane of this joint, and it had raised up the lower fibres of the *pronator quadratus*, which, forming a kind of arc, produced a sort of strangulation of the pedicle at its upper part. The continuity of the cyst with the articulation was completely demonstrated, a probe freely passing from one to the other.

IV. *Luxation of the Femur on to the Ramus Superior (or Descendens) of the Ischium.* By Dr. Krause. (Henle und Pfeufer's Zeitschrift, Band vii. p. 346.)

Dr. Krause describes the case of a man who had fallen on to the frozen ground from a scaffold fifty feet high, nothing having broken his fall. Among other injuries was found a dislocation of the femur. The left limb was in appearance considerably shortened, having the hip and knee-joints flexed, and the ankle stretched out. It was strongly rotated inwards, the foot being directed towards the tarsus of the sound limb. The flexion forward at the hip amounted to about 30°, the rotation to 90°, so that the anterior surface of the thigh was directed inwards. In this position the thigh was immovably fixed, with the exception of slight adduction and flexion. The trochanter was found to be more projecting than on the other side, while the configuration of the region was considerably changed by reason of a large swelling in the vicinity of the ischiatic notch. The head of the bone could be easily felt under the muscles. The patient soon died, the liver and spleen having been ruptured in the fall.

On examination, the head of the bone was found, at the upper end of the *ramus superior* (or *descendens*) of the ischium above the tuber, on a level with the empty acetabulum, so that during life the limb would have been neither shortened nor lengthened. It was only covered with the *glutæus maximus*, the *g. medius* and *minimus* lying upwards and forwards. The sciatic nerve was dragged somewhat inwardly, but without being much torn. The head of the bone was almost immovably fixed, in consequence of the great tension of the tendons of the *obturator externus* and *internus*, which winded around the neck, the one on the upper, the other on the lower side, and compressed it against the portion of the ischium between the tuber and the under edge of the acetabulum. The *pyriformis* and *gemellus superior* muscles were uninjured, although the latter was very tense; but the pressure of the head had completely crushed and pinched in the middle part of the *gemellus inferior*, while its origin and insertion were nearly uninjured, although very tense. The capsule was torn from the posterior surface of the neck close to its insertion, to an extent of more than one-half the circumference of the neck, the torn portions lying across the opening of the acetabulum. The *ligamentum superius* was uninjured, though much stretched, and carried considerably more posteriorly than its normal position. The *ligamentum teres* was torn at eleven millimètres' distance from its insertion in the head of the bone, an enormously extended thin string of it still remaining, and passing obliquely forwards over the head of the femur. An irregular portion of the acetabulum (twenty-seven millimètres by eighteen) was broken off, and lay upon the tendon of the *obturator internus*, which was expanded over the opening in the acetabulum. The fragment must have been carried away under the operation of a force acting from before backwards, the resulting aperture being filled up by the extended tendon of the *obturator internus*. All other parts of the joints were uninjured, as also were the *quadratus femoris* and the other muscles arising from the tuber.

This kind of fixing the head of the bone between the two obturators, the tendons of which, in a normal condition, both lie behind it, could only be brought about by strong flexion, accompanied or followed by rotation inwards. This winding round the neck, together with luxation on the *ramus ischii*, can only be produced by the impulsion of the neck of the femur (the limb being flexed forwards and rotated inwards), by a force acting in the longitudinal axis of the limb, against the upper anterior edge of the acetabulum. This forms the point of support to the fulcrum, around which the continued movement of the head against the pos-

terior edge of the acetabulum takes place. In the present case this broke away, and allowed of the issue of the head backwards between the two obturators. This view of the mechanism of the accident was confirmed by an experiment which the author instituted, and by the statements of the eye-witnesses of the occurrence, who state that the man, slipping horizontally forwards on the scaffold, fell to the ground with his chin and knees together. Re-position, in the event of survival, could here have been accomplished only by prior rupture of the encircling obturators, as these muscles quite prevented all attempts at reduction.

V. *On Fracture of the Costal Cartilages.* By M. Broca. (Bulletins de la Société Anatomique, tome xxx. pp. 334—9.)

M. Broca recently reported to the Paris Anatomical Society upon a specimen of this accident. No clinical history could be furnished, as it occurred in the person of a madman, of robust constitution, who died of cerebral congestion, at the age of thirty-nine. At the autopsy, the cartilages of the sixth, seventh, and eighth ribs were found fractured, and the fragments were solidly united by an osseous callus. This simultaneous existence of three fractures is not unprecedented, as Magendie has recorded an example, and M. Leudet met with a case in which five of the cartilages were fractured by one violent blow. When only one cartilage is fractured, the general form of the chest does not undergo any notable change; for although the fragments may be displaced in an antero-posterior direction, the neighbouring costal arcs oppose any longitudinal displacement. One of the fragments, usually the internal or sternal, forms more or less relief under the skin, but there is no true riding. In the present case, the two last ribs are deprived of the point of support furnished by the sternum, and the fracture is prolonged to the first false rib, so that nothing prevents the riding of the fragments, which at certain points amounts to a centimètre. Between the fragments of the two lower cartilages, there is also a considerable separation in the antero-posterior direction. In spite of these unfavourable conditions, consolidation has taken place by means of an osseous callus, about a centimètre in thickness, which, to use M. Malgaigne's phrase, both separates and unites the fragments. This new osseous production, secreted by the perichondrium, completely surrounds the external fragments; but it is not prolonged over the anterior surface of the internal fragments. This example of bony union by means of a callus derived from the perichondrium, is the only one on record; and was in this case, where the fragments were entirely separated, the only one possible: but when the fractured surfaces still correspond, a direct union may be established between the two ends of the divided cartilage.

M. Broca has found, in experiments made upon the *articular* cartilages of dogs and rabbits, that, at the end of a month, the process of cicatrization is far from being terminated. But there is already to be observed a plastic, demi-transparent, continuous, plastic layer adhering to the two lips of the incision, and exhibiting under the microscope a manifest fibroid condition, which is the first stage of complete fibrous organization. It is only at the end of three or four months that the cicatrix becomes solid, and merits the name of a fibrous callus. As to the newly-formed substance which becomes organized between the divided edges, it is not of a cartilaginous nature; but is purely fibrous, as are, in fact, most of the cicatrices of soft parts.

These fractures are generally said to be due to the operation of *direct* causes; and, in fact, when the great elasticity and flexibility of these cartilages are considered, it is difficult to suppose that they can be broken by causes operating at a distance. Still, a recent case shows that an indirect cause, a mere muscular movement, may suffice for the fracture of these costal cartilages. A porter, aged forty-two, having placed a sack of peas on his left shoulder, another was too suddenly thrown on this. The man was forced forward, and while he rose again he experienced so violent a pain that he was forced to let go his load. The pain occurred

at the anterior inferior part of the chest, a little towards the right side. On examination, there was here observed, seven or eight centimètres external to the mesial line, on a level with the sixth, seventh, and eighth ribs, a well-marked angular projection. Pressure, coughing, &c., produced great pain, but there was no crepitation, and exploration of the chest, as far as the pain permitted it, did not detect any abnormal movement, although the man was very thin. Nothing of the kind existed upon the opposite side, and the patient was positive that prior to the accident his chest possessed its natural configuration. It is, then, highly probable that muscular contraction was here the determining cause of the fracture; for the patient received the shock of the burthen on the *left* shoulder, while it was at the lower part of the *right* side of the chest that the fracture occurred. The man, bent forwards by the violence of the shock, made a sudden and strong effort to preserve his equilibrium, and this effort overcame the resistance of the cartilages.

VI. *Glycerine and Tannin in Vaginitis.* By M. DEMARQUAY. (Bulletin de Thérapeutique, tome l. p. 541.)

In the treatment of this affection, M. Demarquay has found a composition, consisting of eighty parts of glycerine and twenty of tannin, of great service. When the vaginitis first appears, the inflammatory symptoms should be calmed by appropriate regimen, baths, and frequent emollient injections. When the first stage of the inflammation has passed away, and the careful introduction of the speculum has become possible, abundant injections of water are to be thrown in, so as to remove all the muco-pus which lines the walls of the vagina, and these are then dried by a plug of charpie placed at the end of a long forceps. Then, three plugs of wadding, well soaked in glycerine and tannin, are to be introduced. Next day, after a bath, the plugs are removed, new injections made, and the dressing repeated. M. Demarquay has never had to have recourse to more than four or five such dressings. After discontinuing them, astringent injections, consisting of infusion of walnut leaves, in which one drachm of alum to the quart has been dissolved, are employed two or three times a-day for a week or ten days.

VII. *On Wounds over the Olecranon.* By M. VELPEAU. (Moniteur des Hôpitaux, No. 89.)

In relation to a case in which diffuse inflammation of the arm followed a wound over the olecranon, M. Velpeau took occasion to make some interesting remarks. Such wounds call for particular attention, for, owing to the anatomical composition of the region, they may sometimes induce subepidermic or subcutaneous inflammations; while at others, the bursa of the olecranon, the olecranon itself, or the joint, may suffer. When, under the influence of any cause, as of a contusion, inflammation is set up in the tissues separating the point of the olecranon from the corresponding epidermis, it becomes propagated with the greatest ease towards the arm and fore-arm, meeting with cellular tissue, which is abundant, loose, and vascular, in proportion to its distance from the point to which the inflammation was first limited. When the solution of continuity comprises the thickness of the integuments, it is rare for the bursa to escape participating in the inflammation, whence arises a phlegmasia, which, though in itself nowise serious, leads to an unfavourable prognosis, inasmuch as it may give rise to the denudation of the olecranon, or an extension to the joint. The conformation of the part also necessarily adds to the gravity of its injuries. When the elbow in a fall forcibly presses against a resisting plane, the bony edge of the olecranon divides the tissues from within outwards, in such a manner that their attrition extends farther on the deep-seated than at the superficial parts. The wound is thus narrower at its external aperture than in the rest of its extent, and under the influence of

tumefaction this aperture before long disappears. Pus, however, forms, and is usually of bad quality, its presence being almost always announced by its mischievous effects upon neighbouring parts.

VIII. *On Extraction of Cataract at a Single Stroke.* By M. CHASSAIGNAC. (Moniteur des Hôpitaux, No. 74.)

M. Chassaignac observes that several oculists, and especially Wenzel, have extracted cataracts at a single stroke; opening the capsule as the knife traversed the anterior chamber on its way out. This procedure, which has hitherto been justly considered as an exhibition of a somewhat dangerous dexterity, may be very well accomplished by the aid of chloroform. It offers, indeed, great advantages; for, whatever may be the dilatation at the moment of commencing the operation, it contracts immediately after the escape of the aqueous humour, and the knife introduced subsequently may easily wound the iris. In this operation, the pupil remaining wide open, the accident is not to be feared. In other respects, however, Wenzel's operation was really dangerous, and presented difficulties well nigh insurmountable without the aid of chloroform.

M. Chassaignac habitually employs chloroform in his operations for cataract, and the advantages he has derived from it he thinks are due to the observance of the proper principles that should regulate its employment. No patient can be operated upon with security if he has not been brought to the stage of tolerance, that he sleeps deeply and placidly, without irregular movements, restlessness, cries, or delirium. His respiration is normal, his *facies* excellent, his pulse large and full—presenting, in a word, an assemblage of conditions not only well suited to tranquillize the surgeon, but also eminently fitted to facilitate the execution of the operation. Vastly different is it to operate upon an eye rendered quite immovable, and to act upon one essentially mobile, and incessantly seeking to escape from the action of the instruments. Among the accidents thus avoided, is wounding the hyaloid membrane. It is in fact almost always to this accident, and not to the pressure exerted upon the globe of the eye, that is due the escape of more or less of the vitreous humour after cataract operations. This almost inevitable accident, when operating without chloroform, is easily avoided in the immovable state of the eye. The same may be said of wounds of the iris, and most of the accidents consequent on extraction. The possibility of producing vomiting has been urged as an objection to the use of chloroform in this operation, but, by waiting before commencing the operation until the period of tolerance has been reached, M. Chassaignac has never met with vomiting or struggling.

IX. *Case of Extrusion of a Calculus through a Fistulous Opening.* By Dr. TOSCANO. (Wiener Wochenschrift, No. 28.)

N. P., aged sixty-three, had suffered since his eighth year from difficulty in passing urine, and to avoid punishment on account of enuresis, was in the habit of tying up the penis at night. Becoming a soldier, he experienced the severest suffering from the urine while on march, and a swelling often formed at the upper part of the right side of the scrotum, discharged pus and blood, and then healed again. He would have painless intervals of about three years at most, when the urinary fistula would again appear; and, after continuing awhile, cicatrize over again. He was discharged from the army. Some weeks before he was seen by the author, an urinary fistula formed in the right pubic region, all the urine passing through it, and this time it did not heal, as usual. The opening kept getting larger and larger, and a rough, hard body could be felt at its bottom. This, after violent efforts, was discharged, and proved to be an urinary calculus. It weighed 10 drachms, was pyriform in shape, having a stalk-like process, and measured 2 inches 7 lines in its long diameter, and 1 inch 5 lines in its transverse.

Its chemical composition for the most part was oxalate of lime, with some mucus, uric acid, and magnesia. The patient had often been examined professionally, and was supposed to be suffering from schirrous degeneration. The calculus was discharged on the 2nd of June, and, writing about a month after, Dr. Toscano states, that for his age the patient looked very well, and all the functions were performed with regularity. A small, clean, superficial ulcer, with funnel-like edges, and indurated circumference, existed still in the right pubic region, through which a small quantity of urine was discharged. He would not allow any examination of the urethra to be made.

X. *On Extirpation of Enlarged Glands.* By M. Chassaignac. (Moniteur des Hôpitaux, No. 75.)

M. Chassaignac does not regard as inoffensive to the economy, the presence of more or less large masses of suppurating or tuberculous glands, as in the submaxillary or cervical regions. In place of treating them by resolvents, the effects of which are very uncertain, and always very slow, he cuts down upon them, and enucleates them. If their base is too strongly adherent to subjacent parts, or he fears lest he might open some vessel during the dissection, he applies a ligature around the base, and over this his *écraseur*. He does not think it essential to remove the whole of the ganglionic mass; for it is not with such tumours, as with those of a cancerous nature, that we cannot leave the smallest morsel without fearing it may become the seat of reduced development. He only removes as much as can be got at with ease, and without any laborious dissection, even supposing a new ablation may have to be performed.

QUARTERLY REPORT ON MIDWIFERY.

By Robert Barnes, M.D. (Lond.)

LETTSOMIAN LECTURER ON MIDWIFERY, ETC. ETC.

I. Physiology and Pathology of the Unimpregnated State.

1. *Case illustrative of the Age at which Puberty occurs in Eurasian Females.* By W. H. Ross, M.D. (Indian Annals, April, 1856.)
2. *Case of Fatal Bleeding into the Peritoneal Cavity through Rupture of the Ovary.* By M. Demarquay. (L'Union Médicale, 1855.)
3. *Operation of Ovariotomy successfully performed.* By Ezra P. Bennett, M.D., Conn. (Amer. Jour. of Med. Science, April, 1856.)
4. *On the Operative Treatment of Ovarian Cysts, and especially on the use of Iodine Injections for the Radical Cure of Ovarian Dropsy.* By Dr. Fock. (Monatschr. für Geburtsh., Mai und Juni, 1856.)
5. *On the Removal of a Foreign Body from the Canal of the Cervix Uteri.* By Synd Mahomed Jaun. (Indian Annals, April, 1856.)
6. *A hitherto undescribed Disease of the Uterus, namely, Unnatural Patency of the inner extremity of the Fallopian Tube.* By Dr. Matthews Duncan. (Edinb. Med. Jour., June, 1856.)

1. Dr. Ross's case is illustrative of the age at which puberty occurs in Eurasian females. "E— is about 4 ft. 10 in. high, her body is considerably developed, and each breast as big as a split orange; the nipple is not so well formed as the breast; there is hair under the arm-pits and on the mons veneris nearly half an inch long. The girl is of a very modest character, and very retiring. She began to menstruate on the 15th March, 1856, and cried very much when she found her clothes covered with blood. She had an attack of fluor albus six months ago; and more recently, an attack of severe headache and fever. Her father was a fine European, and her

mother an East Indian. The girl's age was satisfactorily proved to be eleven years and nearly five months. The case excited *alarm* in her mother, who never remembered an instance of such early menstruation before.

2. M. Demarquay's case of rupture of an ovary and fatal hæmorrhage into the peritoneum, we record as a valuable contribution to an affection not yet thoroughly cleared up—namely, retro-uterine hematocele. A washerwoman, aged twenty-seven, of sound constitution, of regular menstruation, was seized, without obvious cause, with hæmorrhage of the genitals, which persisted for two months, and greatly reduced her. She was admitted into hospital. Examination revealed fungoid ulceration of the portio vaginalis uteri, which, after applications of actual cautery and nitrate of silver, disappeared together with the hæmorrhage, when the patient suddenly complained of pains in the abdomen and lumbar regions, could eat nothing, and had strong fever. These sufferings increased; the abdomen became very sensitive; vomiting of soapy matter followed; acute pain in the right side, hiccough, anxiety, tympanitis. Death on the second day.

Autopsy.—Skin white, as in persons who have died of hæmorrhage. In the abdominal cavity a considerable effusion of blood; intestines distended with gas; peritoneum injected. In the pubis, about a quart of fluid, black, partly coagulated blood. The omentum investing the pelvic organs was covered with a soft, recent, red-brown membrane. Uterus normal, but plastered over with old adhesions. Fallopian tubes inflamed, the canals obstructed by little abscesses. Left ovary swollen, softened, fragile, greyish, and infiltrated with pus and plastic matter. In the right ovary, which was still more diseased, there was found a laceration in the direction turned towards the Douglasian space, surrounded with black clots of blood. The ovary dissected showed a largely-developed Graafian vesicle filled with blood, and near this an empty one of considerable circumference. All the rest of the tissue was softened by inflammation.

3. Dr. Bennett, of Danbury, Conn., relates briefly a case of ovariotomy terminating successfully. There are no circumstances calling for detailed report. The incision made was only three inches; there were no adhesions; the sac drawn out, was opened first with a trocar, then with a knife, the patient having been turned over on her face. The sac emptied, a double ligature was passed through the pedicle, which was then cut through. The patient is said to have recovered without a single unpleasant symptom. The operation was performed on the 12th January of this year. It will be desirable to have a further report.

4. Dr. Fock, in a very elaborate article, reviews the results of the various methods of treating ovarian dropsy. He adds 130 cases from various sources to those collected by Dr. Robert Lee. Of the gross number, 292 in which ovariotomy had been attempted, the operation could not be completed in 92 on account of errors of diagnosis; and of these, 31 died in consequence of the attempt. The gross result is as follows:—Of the 292 cases partly attempted, partly carried out, there were 120 deaths, 120 radical cures; 52 recovered, but were not freed from their original disease. Thus, $41\frac{7}{73}$ per cent. were cured; $41\frac{7}{73}$ per cent. died; $17\frac{59}{73}$ were uncured; or, if we add together the two last classes under the common title "unsuccessful," we have $41\frac{7}{73}$ per cent. successful, and $58\frac{66}{73}$ unsuccessful.

Dr. Fock also gives in detail and in tabular form 15 cases of ovarian cysts treated by iodine injections, including the original ones of Boinet. In summary we find that of 15 cases, 9 attained a radical cure without after trace of relapse. Of these 9, 4 were healed by *one* injection, 2 by *two* injections, 1 by *three* injections, 2 by *six* injections. In the remaining 6 cases, repeated injections had no effect, and an elastic catheter was left in the cyst, and iodine injections made as occasion required. Of these 3, 2 were healed; 1 died of pyæmia occasioned by suppuration in the cyst. There thus remain 3 cases; in 2 of these, through an error in diagnosis, the iodine injection was made into cysts complicated with car-

cinoma of the ovarium, and life was probably shortened by the operation. In the last case, the fluid collected again after a single injection.

[In the discussion upon Dr. Fock's paper in the Berlin Obstetrical Society, one or two other successful cases were mentioned. The list of continental cases is far from complete; and a considerable number of iodine injections of ovarian cysts must now have been made in this country. The reporter himself has recently injected four ounces of undiluted tincture of iodine into an ovarian cyst with good effect; but the observation is not yet complete. It is desirable to collect the fullest information upon the results of this method of treatment, which seems to hold out the promise of greater success and less danger than any other hitherto pursued.—REP.]

5. The case of Synd Mahomed Jaun is a singular example of a practice pursued with the view of promoting fecundation. The woman who was the subject of operation stated that she had been frequently taking different sorts of native medicines in hopes of becoming a mother. A few days ago, she said, a *machin* (synonymous to a *dai* of Bengal) advised her to introduce a bit of *katore fruit*, cut in a certain shape and of a certain length, into the canal of the cervix during menstruation, and to have sexual intercourse after a certain length of time, having of course previously removed it. Agreeably to this instruction, she said, she had introduced a bit of it some fifty hours ago, and had failed in her attempts to remove it. It had caused considerable inflammation, and on this the author was called in. The foreign body extracted was of a dirty brown colour, soft and friable. It was more than three-quarters of an inch long, and about the thickness of a goose-quill. The *katore* is said to be a kind of nut, trees of which are found in the Bhawulpore district.

6. Dr. Matthews Duncan describes a case of unnatural patency of the Fallopian tube as a hitherto unrecognised morbid condition of the uterus. He quotes instances from Morgagni, Tyler Smith, and others, showing that this patency has been observed after death, or inferred to exist during life. The evidence on which Dr. Duncan rests his diagnosis of this condition is Fallopian catheterism. He relates two cases where patency was thus inferred from the circumstances that the probe passed easily through the uterus towards the right side for eight inches in one instance, and six or seven in the other; and that the end of the probe could then be felt through the abdominal walls. [Admitting that in certain cases this patency exists, it must still appear that it is not a disease *per se*, but rather a consequence of disease of the Fallopian tube.—REP.]

II. PREGNANCY: PHYSIOLOGY AND PATHOLOGY.

1. *A New Mode of diagnosing Early Pregnancy.* By Dr. KEILLER. (Edinb. Med. Journ., June, 1856.)
2. *Note on a little-known Cause of Vomiting in Pregnant Women.* By Dr. RENÉ BRIAN. (L'Union Méd., July, 1856.)

1. Dr. Keiller speaks favourably of an instrument modified from the metroscope of Nauche, for diagnosing early pregnancy. The difference of Dr. Keiller's instrument consists in the different construction of the *uterine stethoscope*, which is introduced per vaginam, and thus applied not to the os or cervix, but to the walls of the uterus. It is contended by Dr. Keiller that by this instrument the auscultatory signs of pregnancy may be detected at a much more early period than by the usual process of external auscultation. [Dr. Montgomery, in the recent edition of his great work 'On the Signs of Pregnancy,' does not speak well of the metroscope.]

2. Dr. Brian records a case of obstinate vomiting in a pregnant lady, which he saw in consultation with M. Moreau. After a long course of therapeutical means had failed, a vaginal examination revealed a retroverted condition of the womb. When liberated and allowed to rise out of the pubis, the vomitings ceased, and pregnancy went on favourably.

III. Labour.

1. *Carbonic Acid as a means of inducing Premature Labour.* By Scanzoni. (Wiener Med. Wochenschr., Nr. 11, 1856.)
2. *Case of Abnormal Labour: Presentation of the Abdomen; Escape of the Intestines of the Fœtus through its Umbilicus.* By M. Penjon. (L'Union Médicale, July, 1856.)
3. *Central Laceration and Transit of the Fœtus through the Perineum.* By John F. Lamb, M.D., Frankfort, Pa. (Amer. Jour. of Med. Science, April, 1856.)
4. *On Stricture of the Uterus.* By Dr. Lehmann, of Amsterdam. (Nederl. Tijdschr. v. Geneesk. 1855.)
5. *Two Cases of Rupture of the Uterus.* By Dr. Mangold, of Cassel. (Monatsschr. für Geb., Juli, 1856.)
6. *Death of the Fœtus caused by Torsion of the Umbilical Cord.* By Dr. Hafner. (Monatsschr. für Geb., Juli, 1856.)

1. Scanzoni, moved by the observation of Brown-Séquard, that carbonic acid irritates the smooth muscular fibre to contraction, and convinced of the insufficiency of his method of exciting labour by suction of the breast, has sought in carbonic acid a new means of exciting labour-pains. In a very small primipara, aged twenty-six, premature labour was indicated by contraction of the pelvis. She was in the 32nd-34th week of gestation. The portio vaginalis was five to six inches long, tolerably resistant; outer os uteri fast closed; the head floated; the fœtal pulse faintly heard. On the 2nd February, the first application of twenty minutes without subjective or objective alteration.

3rd February, eight A.M., for twenty-five minutes, and in the evening, thirty minutes. During the injection, prickling in the vagina; during the day often stinging in the region of the umbilicus; in the evening the portio vaginalis was loosened. The stingings were renewed in the night.

4th Feb. Morning and evening, each time half an hour. Prickling in the vagina. In the course of the day, the os uteri admitted the finger through, and the presenting head could be reached. In the night labour-like pains, and towards morning lively contractions of the uterus, which, later, ceased.

5th Feb. Prickling during the thirty minutes of the injection. The os was opened, yielding, dilatable. Increased vaginal secretion. About noon, painful persisting contractions; about half-past six P.M., rupture of membranes; seven P.M., birth of a living child over three pounds weight. Slight metrorrhagia, which ceased after the removal of the placenta. Recovery good.

Apparatus.—A glass vessel, holding a quart, is fitted with an air-tight cork-stopper, in which are two openings. Through one opening runs a glass tube provided with a funnel; through the other runs a horn tube fitted with an elastic tube three feet long, which ends in a bent uterine tube. Two tablespoonfuls of bicarbonate of soda, dissolved in twelve ounces of water, and a little vinegar, serve to supply the carbonic acid. A conical glass speculum and the uterine tube are introduced into the vagina, the tube being surrounded by a cork filling up the speculum, so as to retain the carbonic acid in the vagina.

2. The case of M. Penjon is rare, if not unique. A woman, aged forty, primipara, came under his care in labour, on the 4th March, 1855. The child was ascertained to be alive by the cardiac sounds. A transverse presentation was ascertained. After some hours, the patient sent for M. Penjon, saying something

soft and extraordinary had escaped from the vagina. A loop of intestines was recognised. A colleague concluded, after examination, that the intestines proceeded from a rent in the vagina of the mother. Turning being decided upon, and the hand introduced for the purpose, the umbilical presentation was detected; the feet were directed to the left near the fundus, the head to the right, and more elevated than the feet; the maternal organs were intact. The placenta came away spontaneously. With the exception of the umbilical tumour, the fœtus, which was of the female sex, offered nothing unusual; it was well developed, and about fifty centimètres long. The tumour, which M. Penjon was not allowed to dissect, was formed by the intestines, liver, spleen, and no doubt the stomach, seated in the umbilical cord.

3. Dr. Lamb records an example of that simple accident, central laceration, or perforation of the perineum. It occurred in June, 1821, in a primipara, aged thirty. The occiput presented to the right sacro-iliac synchondrosis. For some hours the parts seemed unyielding. The infant seemed to have "jumped through the perineum!" A single pain had expelled the child. The fourchette and sphincter ani were uninjured. The patient was kept on her back, thighs in apposition, for some days. The wound healed by first intention. She has since borne several children.

4. Dr. Lehmann gives a minute analysis of the forms of irregular uterine contraction, under the name of stricture of the uterus. Stricture of the uterus, he says, a partial tonic spasm, happens almost exclusively in the direction of the transverse fibres, especially in those places where the circular fibres predominate, at the lower part of the body of the womb, at the os internum and os externum uteri, and in the neighbourhood of the Fallopian tubes.

Tonic spasm of the lower part of the body causes a ring or band-like contraction more or less broad, which, when well developed, can be felt through the abdominal walls. The uterus seems to be irregularly shaped lengthwise, reaches to the pit of the stomach, and is often divided into two unequal halves, so that the lower half is separated like a strongly distended urinary bladder. The introduction of the hand makes the diagnosis clearer; mostly, a small, smooth, defined line, stronger in front, can be felt. The spasm-affected part is very painful to the touch, and the pain, as well as the contraction, remains beyond the labour-pain. The conclusion is erroneous, that these strictures happen only in the fifth stage; they are observed nearly as often in the third, and frequently they arise first when the head and shoulders are behind, or when, in a breech presentation, the breech is partly born. This condition is known by the following marks:—in spite of strong pains the presenting part recedes, and although no obvious obstruction exists in the pelvis. When head presents, it is found that the pains do not drive it down on the os uteri, showing that the obstruction does not lie here, but higher up. If, in such a case, through wrong diagnosis, forceps be used, the blades pass readily through the os uteri, but in pressing deeper strike upon an obstacle which cannot be overcome without great pain. If the application of the forceps be accomplished, it is found on each extractive effort, that the uterus is dragged down too. If turning is tried, the stricture is much more easily recognised. The hand easily penetrates the cervix uteri, but the fingers are with difficulty squeezed between fœtus and uterus, and if a smarting hand be passed through it, it is quickly paralysed by the compression. This stricture is more easily known in the fifth stage, when the fingers may be passed to the contracted part, and the hour-glass form recognised.

The *spasmodic stricture of the inner mouth of the womb* is most frequent in the fifth stage, but rare during the extrusion of the child. It is recognised by the same signs, only nothing can be felt through the abdominal walls; on the other hand, it is easily detected by vaginal examination. The os uteri externum may be flaccid and widely open, without trace of contraction.

The *spasmodic stricture of the os uteri externum* is the least dangerous form. Early in labour, it is clear to the observer that the pains are irregular and painful, the patient is restless, and uncomfortable. The strong boring pains are felt chiefly deep in the hypogastrium, and spread towards the sacrum and thighs in the course of the ischiatic nerve. The vagina is mostly hot, dry, and sensitive; the os uteri remains deep in the pelvis, and has very thin sharp edges, which, even in the interval of contractions, are stretched like a cord. The presenting part lies firmly on the lower segment of the womb, and even if a little engaged in the os uteri, a large swelling is caused by the pressure of the stretched edge. The sphincters in the neighbourhood often share in the spasm, and dysuria and tenesmus follow; or there arises, through the extension to the other nerve-spheres, hiccough, vomiting, cough, anxiety, and oppression; in the highest degree, the central nervous system is even affected; syncope, headache, delirium, sopor, convulsions, whilst, although the pains may continue, what is called metastasis takes place.

The *spasm of the mouths of the Fallopian tubes* only occurs in the placental stage. The womb assumes a remarkably oblique shape, as if the affected part had been lengthened out like a horn, as can be felt as well as seen.

Uterine strictures, when they occur, must be regarded as consequences of irregular contraction; but they may exist, according to Lehmann, as a real alteration of tissue at the affected part; this may have arisen before the beginning of the stricture, or may follow upon a long-continued contraction, through which stasis in the uterine vessels, hyperæmia and inflammation of the whole organ may be easily developed. Not seldom it is observed that an ordinary clonic spasm passes gradually into a stricture, especially in the lowest part of the womb. Still more frequently it happens that, in a clonic spasm, at the time when the child is extruded, an uterine stricture follows in the fifth stage. But the predisposition to stricture often rests in the uterus, as in hyperæsthesia, through a rheumatic or inflammatory action, when an alteration of tissue may have existed during pregnancy. Besides this, strictures may arise, or become worse, through bad presentations of the child, after premature escape of the liquor amnii, through irritation of the os uteri from the frequent exploration, or instrumental interference.

Stricture of the uteri always perverts the course of labour, but naturally according to the degree, duration, seat, and stage of labour. The effect of the compression is also severely felt by the child. Bruises are sometimes seen, and asphyxia; the liver has been known to have burst. The uterine walls may be rent.

Lehmann advises to bring about retraction of stricture by venesection, opium, warm baths, belladonna injections. He has found ether and chloroform without influence.

5. Two cases of laceration of the uterus, related by Dr. Mangold, serve to illustrate the etiology of this accident:

Case I.—A woman in her eighth pregnancy. Had been delivered on a previous occasion by turning. For four weeks she had, without apparent cause, suffered a loss of coagulated blood; and for the same time, almost every night, labour-like pains. When seen, regular pains had set in; the membranes had burst half an hour, but very little water escaped. The midwife could feel no presenting part, nor even the os uteri. Outward examination revealed an extraordinarily stretched abdomen, enlarged transversely; fundus uteri somewhat lower than usual, and no part of the child. Inward examination: a varicose vagina; uterus easily reached, but no os, and no scar to indicate an obliteration of this part. Powerful pains went on. Case left to nature. Pains became even more violent; and when, after three hours from first visit, Dr. Mangold saw her again, he found the following condition:—The patient lay still, and without pain; face pale, cold, and collapsed; pulse almost imperceptible; extremities cold. Outward and inward examination

showed no change. The pains had suddenly ceased, and this condition followed. Death ensued shortly, caused by loss of blood.

Autopsy.—The muscular wall of abdomen remarkably thin. A rent in the uterus, six inches long, in direction of the linea alba. This rent had penetrated the substance of the uterus, but not the investing peritoneum, so that there was no escape of the child or liquor amnii. The os uteri was a cross-fissure, open to one inch, and squeezed tightly against the abdominal wall, above the pubic symphysis. The child lay crosswise, was well developed, weighed eight pounds, and was twenty-four inches long. There was great effusion of blood in the uterus.

Case II.—A woman, aged twenty-four, of middle size, had menstruated with great pain at sixteen, a condition which lasted until her pregnancy. During the first months of gestation, her sufferings were increased, and vomiting superadded. These subsided at about fourth month. About the twentieth week, she awoke with acute pain in lower belly. When seen, she lay drawn up on her right side; face pale, sunken; look wild, hands cold, no pulse. She complained of pain in the whole right side; numbness and formication in the right thigh. Examination external and internal revealed nothing remarkable; os uteri quite closed, as at this period of gestation. After half an hour, pains came on in the hypogastrium, grew gradually stronger and stronger, and reached a frightful intensity. Slight convulsions affected the upper part of the body, and death followed.

Autopsy.—On opening the abdomen, an extravasation of coagulated blood was found. In the right side of the hypogastrium, near the pubic arch, was found the fœtus, partly covered by blood-extravasation and folds of intestine: well-formed, male, of the size natural to its age, fresh and red, showing no sign of anæmia. The uterus rose a few inches above the pubis. In its fundus was a rent, running from before backwards, and somewhat to right, of two inches and a half long, partly filled by the placenta. The structure was remarkable. At the neck and lower part of the body, the consistence was natural; upwards it was thinner; and at the upper part and fundus, the body of the uterus was quite membranous. This whitish membrane, which was covered internally by the remains of the decidua, had scarcely the thickness of stout paper. The placenta, which was seated upon the lower and more fleshy part of the organ, had not been detached: it was very vascular.

6. Dr. Hafner has twice observed death of the fœtus and abortion caused by tortion of the umbilical cord obstructing the placentar-fœtal circulation. The operation of these structures is, he says, clear: on the one side the fœtus gets a constantly-diminishing supply of blood in relation to the wants of growth; on the other side, the placental circulation is obstructed backwards, and congestions are occasioned, which are relieved by hæmorrhages into the uterus, and thus lead to abortion.

IV. Puerperal State.

1. *Report of Twenty-seven Cases of Puerperal Peritonitis.* By Robert K. Smith, M.D. (Phil. Med. Examiner, April, 1856.)
2. *Puerperal Tetanus, in 'Notes on some of the Diseases of India.'* By Edward J. Waring. (Indian Annals, April, 1856.)

1. Dr. R. K. Smith relates the histories of twenty-seven cases of puerperal peritonitis, constituting an epidemic that raged in the obstetric department of the Philadelphia Hospital from December, 1855, to February, 1856.

The following is a concise summary of the facts:—Previous to the appearance of puerperal fever there were "a number of cases of erysipelas in the hospital;" there were still other cases after the fever had ceased. There were also seventeen" other obstetrical patients who occupied the same wards, many of them adjoining beds to the fever patients, that escaped an attack.

After several of the first cases occurred the remaining pregnant women were removed to wards not previously occupied by obstetrical patients; and some of them were transferred to rooms in the medical department immediately upon their admission. This department is in a separate building. These removals had no effect in arresting the progress of the disease; it followed the patients wherever they went, until no more pregnant women were admitted.

Nearly every child of women having puerperal fever died in convulsions.

Of 29 cases (including 2 not reported), 12 recovered. *Symptoms.*—The symptoms, as derived from the details of the cases, generally were:—Chills within about forty-eight hours after delivery; pains in lower belly, pain on pressure, face flushed, skin hot, headache, thirst, pulse small, quick, 110 to 130 or 140. Milk and lochia not generally arrested. Diarrhœa, vomiting, tympanites, hectic, followed. Dorsal decubitus, legs drawn up. In some cases, inflammation of distant organs, fine crepitation of lungs, pleurisy. Sometimes delirium (in one case maniacal excitement), stupor. Several of the patients were quite anæmic, but this was the result of the rigorous antiphlogistic treatment pursued.

Treatment.—The most resolutely antiphlogistic. Bleeding at onset to twenty, thirty, or forty ounces; sometimes six dozen or two hundred leeches to abdomen; calomel and opium, in some cases to salivation; hot poultices to abdomen; enemata of castor oil and turpentine when tympanitic.

Post-mortem Appearances.—In one case the marks of inflammation were so slight as to prove that inflammation was not the essential primordial condition of the disease. In others, the results of inflammatory action were obvious. Inflammation of the uterus, and a condition of the cavity which the author calls "gangrenous," peritonitis sometimes slight, in some cases extensive and attended by effusion, mostly purulent; plastic exudation is not specified.

(The cases prove that the epidemic was of a septic character, not freely inflammatory.)

2. Mr. Waring's notes on puerperal tetanus are of especial interest. He says, "Of this very obscure form of the disease little is apparently known; and this is not a little remarkable, as from its extraordinary frequency at Bombay it cannot but repeatedly have come under the observation of medical officers at that Presidency. In the three years ending December, 1853, no less than 232 women are recorded as having perished from this malady; and it would appear as if it had been on the increase, as from 38 deaths from this disease in 1851, we rise to 87 in 1852, and 108 in 1853." In a table, Mr. Waring shows the cause of this increase more in detail, month by month in the three years. "A considerable increase," he observes, "of mortality took place towards the close of the rains, 30 per cent. of the number dying in the three last months of the monsoon (August, September, and October); whilst in the three months immediately preceding the setting in of the rains (February, March, and April), only 15 per cent. of the deaths occurred. Dividing the year into two seasons, the wet and the dry, we find the proportions to stand thus:

Wet season (May to October inclusive), 127 deaths, or 54·4 per cent. Dry season (November to April inclusive), 106 deaths, or 45·5 per cent. Great humidity of the air (such as exists in Bombay during the rains) seems, therefore, to increase the mortality from this disease, though not in any very marked degree.

The frequency of this disease in Bombay is rendered the more remarkable by the comparative rarity of other fatal puerperal affections; during the same period, the whole number of deaths by puerperal fever being 21, by puerperal convulsions 2, by phlegmasia dolens 1.

The period of accession of the tetanic affection in the 233 fatal cases—a most interesting feature—is shown in the following table:

First day	7, or	3·00 per cent.	Eleventh . .	2, or	0·85 per cent	
Second	32, or	13·73 ,,	Twelfth . .	9, or	3·86 ,,	
Third .	29, or	12·44 ,,	Thirteenth .	4, or	1·71 ,,	
Fourth	23, or	9·87 ,,	Fourteenth .	1, or	0·42 ,,	
Fifth .	22, or	9·44 ,,	Seventeenth .	1, or	0·42 ,,	
Sixth .	32, or	13·73 ,,	Eighteenth .	1, or	0·42 ,,	
Seventh	15, or	6·43 ,,	"Soon" .	10	or 5·15 ,,	
Eighth.	14, or	6·00 ,,	Not stated .	2		
Ninth .	15, or	6·43 ,,				
Tenth .	14, or	6·00 ,,	Total . .	233		

It thus appears that up to the eighteenth day after delivery the patient is liable to the supervention of tetanus, although the liability greatly diminishes after the sixth day; the number dying during the first six days amounting to 145, leaving only 88 to be distributed over the remaining twelve days.

Trismus nascentium does not appear to be a frequent, or at any rate a fatal, disease in Bombay; during the above three years only six deaths being recorded under this heading.

Mr. Waring shows, in another part of his most valuable paper, that during the same three years there died out of 42,651 (the total deaths in the town of Bombay), 912 from tetanus: thus there was 1 death from tetanus to 46 from all causes. This enormous mortality from tetanus is the more remarkable when it is borne in mind that the puerperal form is excluded in this enumeration.

MEDICAL INTELLIGENCE.

The Eastern Hospitals.

THE magnificent establishments for the sick and wounded which the English army formed at Balaklava, Therapeia, Scutari, and Renkioi, are now among the things that were. The Crimea was first emptied of its sick, and the Castle and Monastery hospitals were dismantled and broken up. Renkioi was cleared out in June, and Scutari in July. The amount of stores collected at Scutari to supply the several hospitals was enormous: the deficiency of 1854 had led the Government to form a store *dépôt* which could not be exhausted by any emergency. Great quantities of these stores were sold, and only those articles which did not find a ready sale were sent home. The loss on the forced sale must be very considerable, but such losses are among the necessary consequences of war.

The wooden houses at Scutari have been sold by auction; and those at Renkioi have, we understand, been purchased, with the land on which the hospital stood, by a Greek firm.

Whatever may have been the failures in the hospital department at the commencement of the war, failures consequent upon the unprecedented nature of the campaign and the want of early information given to the medical department, there can be no doubt that, at the close of the war, no army ever had such field hospitals in the front, or such perfectly-organized secondary establishments in the rear. Scutari had been made as perfect as the nature of its buildings would permit; and Renkioi, devised by Mr. Brunel, was a model of comfort and convenience.

The perfection of the medical arrangements is shown most strikingly by the almost incredible healthiness of the English army during the winter of 1855-56. The public have already learnt that the losses of the French paralleled, or more than paralleled, those of the English army in the previous winter. It has been supposed that at least 20,000 French died in the five months from November to March. Eleven per cent. of the Sisters of Charity in the French hospitals at Constantinople died of typhus alone. We have no means of knowing what was the

loss of this class in the Crimean ambulances. The loss of medical men was also so great that aid was obliged to be given from the English hospitals at Scutari.

It is not so well known that the losses of the Russians, after the taking of Sebastopol, and when there was a cessation from actual warfare, were still greater than those of the French. Not only among the garrison of Sebastopol, but in the distant camps of Bakshiserai and Simpheropol, where no hostile shot was ever fired, and at Odessa, typhus fever prevailed with extraordinary intensity. Scurvy, also, was most widely diffused; and we have been informed that no scorbutic patient attacked with typhus was known to recover. It is impossible to know the numerical loss of the Russians, but it may reasonably be conjectured to have been proportionably much greater than that of the French. In fact, there can be little doubt that the Russian army was most seriously lessened in number, and that the first movements of the Allies would have shown its weakness.

Now by the side of these facts, first that the French army was so reduced that even its numerical superiority over the English would not have been great in the campaign which the peace has stopped; secondly, that the Russian army was so decimated by disease that it must have fallen back before a vigorous advance—put this other fact, that the English army, placed under similar circumstances and acted on by the same causes of disease, preserved its numerical strength, and would have continued the war with men in the highest health and vigour. So struck were the Russians with this difference, that, at the proclamation of peace, their medical chief applied, we have been told, to the English authorities, for a copy of the regulations and customs which had preserved the English from the visitation which had fallen so heavily on themselves. In fact, the effect of these regulations would have influenced the campaign of 1856; and it is not too much to say, that the freedom of the English from disease during the last winter would have had a vital effect on the progress of the offensive operations.

If, then, there was a momentary failure in the medical department, they have nobly redeemed it. We do not know to whom the wise arrangements to which we have referred were owing, whether to Sir John Hall or to Dr. Sutherland, the excellent sanitary commissioner. Probably it was a conjoint operation, but we trust that the Government will take care to reward the men, to whom would have been owing, far more than to any general, the success which, according to all human foresight, would have signalized the campaign which the peace cut short.

Military Sanatoria.

A PLAN has recently been promulgated by Dr. Pincoffs, late of the Civil Staff in the East, and is now under the consideration of the authorities, of establishing sanatoria for invalided soldiers. The sanatoria are intended to be in connexion with thermal springs, at the sea-side, or at some watering-place likely to be conducive to the benefit of the wounded or diseased. The proposition is only novel as regards England. Abroad, in Germany, France, and Italy, for instance, such institutions have long since existed, and have been shown to bear excellent fruit. If we express ourselves in favour of the scheme, we do it not because it is theoretically plausible, but because similar systems have been extensively tried, and have long been a part of the military organization of other countries. We cannot now go into the numerous questions which suggest themselves in connexion with this topic; but as the general interest in all matters connected with the great struggle in which we have lately been engaged will soon subside, and this thing, if done at all, must be done soon, it is right that the profession should be aware of the proposal, and know something of its merits. Nothing will prove more conclusively the value which our French friends place upon their watering-places than the simple fact, that at six different places of the kind, they possess military sanatoria or hospitals. We give their names, with the main constituents and the respective temperatures of the waters; Amélie-les-Bains, sulphureous, 142° Fahr.; Barèges, sulphureous, 97° Fahr.; Bourbonne-les-Bains, saline, 138° Fahr.; Bour-

bonne-l'Archambault, chloride of sodium, 140° Fahr.; Guagno, in Corsica, sulphureous, 106° Fahr.; Vichy, alkaline, 118° Fahr.

In Piedmont we find a military hospital at the thermal waters of Acqui, which are sulphureous and possess a temperature of 113° Fahr. Similar institutions are to be found in the well-known watering-places of Carlsbad and Töplitz in Germany.

The beneficial effect of thermal and other mineral waters in promoting the elimination of morbid poisons, by aiding in the metamorphosis of the tissues, or in giving tone to the system, can scarcely be denied. The form with which we are most familiar is the sea-bath. But those who possess an extensive acquaintance with the watering-places of this and other countries are familiar with results of as decisive a character as the seaside produces. The military sanatoria of the class alluded to are found to assist in the recovery from disease and injuries to which soldiers are peculiarly liable. Inveterate rheumatism, diseases of bones, skin diseases, syphilitic affections, are peculiarly amenable to treatment by the thermal sulphureous springs and other thermal waters; whilst wounds and ulcers, with the secondary effects of the various injuries to which the soldier is liable, are often found to undergo a change and amelioration under their influence when ordinary medication was failing to work a cure. We gather from a work by M. Herpin,* containing very elaborate calculations, that the following is the percentage of cases benefited by this mode of treatment:

Cured	26 per cent.
Relieved.	48 per cent.

Thus, 74 per cent. of cases which had passed through the ordinary hospital treatment were decidedly benefited; cases which, but for the sanatoria would probably have been allowed to linger out their lives as hopeless invalids. It is to be especially remarked, that the most favourable per-centage is found among the rheumatic cases, which nearly regards us as the most rheumatic nation in the world.

It is, then, a very proper matter for the consideration of our military authorities, whether cause can be shown for the establishment of sanatoria for our own troops, either at home or abroad. We are glad to find that the plan has met with the countenance of some parties whose influence can scarcely fail to secure its realization.

BOOKS RECEIVED FOR REVIEW.

Neue Untersuchungen über den feineren Bau des Centralen Nervensystems des Menschen. Von Joseph von Lenhossek. Wien, 1855. pp. 70.

Varicose Veins, their Nature, Consequences, and Treatment. By Henry T. Chapman. London, 1856. pp. 99.

The Microscope and its Revelations. By W. B. Carpenter, M.D., F.R.S., &c. London, 1856. pp. 776.

The Complete Handbook of Obstetric Surgery. By Charles Clay, M.D. London, 1856. pp. 290.

Traité Pratique des Propriétés Curatives des Eaux Thermales Sulfureuses d'Aix-la-Chapelle. Par L. Wetzlar, D.M. Bonn, 1856. pp. 82.

A Treatise on Cancer of the Breast and of the Mammary Region. By A. Velpeau. Translated by W. Marsden, M.D. London, 1856. pp. 293.

Ismeer; or, Smyrna and its British Hospital in 1855. By a Lady. London, 1856. pp. 350.

The Treatment of Aneurism of the Arteria Innominata. By William Wright, M.D. pp. 39. (Reprint.)

A Practical Treatise on Stammering. By J. Ayres Poett, M.D. London, 1856. pp. 50.

Letters to a Young Physician just entering upon Practice. By James Jackson, M.D. Fourth Edition. London, 1856. pp. 344.

On the Fractures of Bones occurring in Gun-shot Injuries. By Dr. Stromeyer. Translated by S. F. Statham. London, 1856. pp. 120.

Report on the Pathology of the Diseases of the Army in the East. London, 1856. pp. 120.

New York Medical Times. Vol. V. No. 8.

Museum Anatomicum Holmiense Sectio Pathologica. Fasciculus I. Holmiæ, 1855.

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* **Etudes Médicales et Statistiques sur les Principales Sources d'Eaux Minérales de France, d'Angleterre, et d'Allemagne. Par M. le Dr. J. Ch. Herpin (de Metz), Lauréat de l'Institut, &c. Paris, 1856.**

Notes of Three Lectures on the Physiological Action of Strychnia. Delivered by George Harley, M.D. (Reprint.)

Histology of the Cholera Evacuations in Man and the Lower Animals. By W. Lauder Lindsay. (Reprint.)

A Treatise on the Cure of Stammering. By James Hunt, M.R.S.L. Second Edition. 1856. pp. 10.

Lectures in Reply to the Croonian Lectures for 1854, of Charles West, of London. By H. Miller, M.D. 1855. (Reprint.)

A Review of the Present State of Uterine Pathology. By J. H. Bennet, M.D., &c. London, 1856. pp. 99.

The Half-yearly Abstract of Medical Sciences. Edited by W. H. Ranking, M.D., and C. B. Radcliffe, M.D. Vol. XXIII. 1856.

The Retrospect of Medicine. Edited by W. Braithwaite. January to June, 1856.

The Epidemic of Yellow Fever in Norfolk, Portsmouth, and Virginia, in 1855. By J. D. Bryant, M.D. Philadelphia, 1856. pp. 39.

Assurance Magazine, July, 1856.

The Indian Annals of Medical Science. No 17, April, 1856.

The Philosophy of the Stomach, or an exclusively Animal Diet is the most wholesome and fit for Man. By Bernard Moncriff. London, 1856. pp. 92.

Tenth Report of the Commissioners in Lunacy to the Lord Chancellor.

Cases of Nerve Disorder. Recorded with reference to the probable operation of Malaria as a cause. By C. Handfield Jones, M.B. (Reprint.)

L'Hydrothérapie comme Moyen abortif des Fièvres Typhoides Par R. T. L. Diemer, M.D. Paris, 1856. pp. 128.

The Surgeon's Vade-Mecum. By Robert Druitt, L.R.C.P. Seventh Edition. London, 1856. pp. 760.

Remarks on the Lunacy Laws, as also Asylums of Scotland and France. By I. Webster, M.D. (Reprint.)

Statistical Account of Obstetric Cases in private Country Practice. By R. U. West. (Reprint.)

On a Peculiar Power possessed by Porous Media of removing Matter from Solution in Water. By Henry M. Witt, F.C.S. pp. 12. (Reprint.)

The Progress of Preventive Medicine and Sanitary Measures. By A. W. Barclay, M.D. 1856. pp. 35.

A Complete Guide to Government Appointments and to the Civil Service Examinations. By J. C. Hurst. London, 1856. pp. 56.

Norsk Magazin for Lægevidenskaben. x. Bind, 4, 5, 6 Hefte.

Forschungen über Wichtige Naturerscheinungen in einer Reihe von Abhandlungen dargestellt von Hermann Horn, M.D. 2te Aufl. München, 1856.

An Exposition of the Signs of Pregnancy. By W. T. Montgomery, M.D. Second Edition. London, 1856. pp. 706.

A Comparative Inquiry as to the Preventive and Curative Influence of the Climate of Pau, &c. By Alex. Taylor, M.D. London, 1856. pp. 355. A New Edition.

An Account of some Experiments on certain Seaweeds of an edible kind. By John Davy, M.D. (Reprint.)

On the direct Action of Strychnine upon the Spinal Cord. By Geo. Harley, M.D. London, 1856. (Reprint.)

A Practical Treatise on Disorders of the Stomach. By James Turnbull, M.D. London, 1856. pp. 160.

Archiv für Ophthalmologie. Bd. ii. Abth. 1 and 2. 1856.

Army Meteorological Register for twelve years, from 1843 to 1854 inclusive. Prepared under the direction of Brevet Brigadier-General Thomas Lawson, Surgeon-General U.S army. Washington, 1855. pp. 763.

The Medical Profession in Ancient Times. An Anniversary Discourse. By John Watson, M.D. New York, 1856. pp. 222.

The Treatment of Cancerous Disease by Caustics. By Langston Parker. London, 1856. pp. 40.

Annalen des Charité Krankenhauses. Band vii. Heft 1.

The Treatment of the Insane without Mechanical Restraints. By John Conolly, M D. London, 1856. pp. 380.

Annual Report of the Grant Medical College. Bombay, 1856.

Criminal Lunatics, are they Responsible? A Letter, &c. By J. Russell Reynolds, M.D. London, 1856. pp. 39.

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